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FINAL REPORT

PROJECT 2: FIELD TESTS TO PROVIDE STRAW PRODUCTION DATA TO CORRELATE BIOMASS, COMBINE YIELD, AND RECOVERABLE STRAW DATA

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Final Report

Field Tests to Correlate Biomass, Combine Yield and Recoverable Straw

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1. Summary

The test results successfully showed that the results of estimation of straw yield could be considerably different depending upon the method used to determine the yield. These results will vary, not because of inaccuracy of the methods used but because often there are inherent changes to the crop at each stage of measurement. If these differences are considered, then the results do provide an accurate picture of the type of material available at each stage of harvest.

The tests all produced similar grain yields for each test plot, except in the case of the poor crop stand where it was obvious that with combine yield a significant amount of crop was lost by the combine's inability to pick the short straw and heads off the ground. However, even in this case there was still good correlation between the combine collection of grain yield and the harvested windrow's straw yield.

The m^2 samples were processed in a manner to determine the effect on straw yield resulting from a change in the stubble height. The straw at the base of the plants provided a greater percent of straw yield than the simple relationship of its percentage of total length. The results provided a comparison of straw yield for different stubble heights up to 30 cm. These results were important because they confirmed that there is a close relationship between straw yield from m^2 samples and straw yield from the combine collection data when specific stubble heights were considered.

The straw yields measured using the collection behind the combine method were slightly lower than the straw yields that were calculated for the estimated stubble height. However, a slight error in estimating the stubble height would easily account for most of this difference. It was also possible that some of the difference may have been caused by straw being converted to chaff or chaff being trapped in the straw. These differences became inconsequential when considering the baled straw recovery results.

The straw yields from baling indicated that by the time that the crop was harvested and baled the recovered straw was only 40 to 50% of the total grown. Obviously a significant amount remained as stubble. However, of the material that was discharged from the combine separator, in the good crop stands produced by the first Hard Red Spring wheat and the Canada Prairie Spring wheat crops, only 77% and 66% respectively of that material was converted into baled straw. Surprisingly, in the poor stand of Hard Red Spring wheat, although a major amount of crop never made its way into the

combine, nearly all of the straw from the combine was recovered through baling. One can only speculate as to the cause of this but this particular crop was very light and had a lot of weed undergrowth which may have supported the straw well, allowing for better baling recovery.

The combination of combine and baler type did have an effect on straw recovery efficiency. Either a square or round baler worked reasonably well for baling the straw left by a conventional combine. The square baler used was able to bale straw from the rotary. However, the bales were not well formed or easy to handle without breaking. The straw yield appeared to be less than with the conventional combine but not enough testing was done to factor out the variability of the windrows, so an accurate comparison of efficiency was not possible.

Time of baling after harvest, in this limited test, had very little effect on the amount of straw that was recovered through baling. There were no instances of heavy rain between the initial and the delayed baling.

2. Technical Report

2.1 Introduction

The Prairie Agricultural Machinery Institute (PAMI), of Humboldt Saskatchewan, conducted this proposal under funding provided by the Agricultural Development Fund (ADF) of the Department of Agriculture and Food of Saskatchewan and Agriculture and Agri-Food Canada.

Presently, reliable data is available about grain yields across Western Canada. This can be correlated to soil zones, rainfall etc., which is useful to scientists, consultants and others engaged in planning and developing models for supply, transportation requirements, and resource management, etc. However, there have been no comprehensive measurements done that link the grain yields to the amount of straw or chaff material produced by the rest of the plant and recoverable from the field. This is not to say that there have not been measurements made in various manners. Measurements have been made where the plants have been harvested at ground level, there have been measurements of material discharged from combines, and there have been measurements of the amount of straw that can be harvested after combining.

However, without having all of these measurement methods conducted on the same plots and related to the grain yield and other plant characteristics, the data, in many cases, has seemed to be contradictory. As a result, depending upon which data was used the conclusions varied considerably.

In this project all three types of measurements were conducted in the same plots and these included small samples (1 m^2), medium size samples from combine collections and larger samples from several windrows. These samples were tested in wheat crops since wheat is by far the largest amount of crop grown in Western Canada and is a potential source of biomass for use in strawboard or energy production. Preliminary data was also gathered to check for an indication of the effects of time after harvest on recovery by baling, the effects of the type of combine used (rotary vs. conventional) and the effect of the type of baler used (square vs. round). This project is also tied in closely with other projects where m^2 samples were taken in various wheat crops in the different soil zones in Saskatchewan and to studies being done on the effects of storage on straw.

2.2 Project Objectives

The project has several distinct objectives that include:

- Conducting tests which compare meter square samples to combine test size samples to baled straw recovered from larger field situation samples. In relative size this represents 1 m^2 for hand gathered samples, about 50 m^2 for combine gathered samples and about 7,000 m^2 for large strip samples of bales and grain.
- Determining the effect of time after harvest, before baling, on straw recovery efficiency. This would compare baling immediately after harvesting, baling one week later and two weeks after harvest.
- Determining the effect on straw recovery due to combine design (rotary vs. conventional).
- Establishing the effect of straw moisture at baling time on straw recovery) possibly on different balers and for different combines).
- Determining straw recovery efficiency based upon the type of baler (round vs. small square) at different straw moistures.

Meeting these objectives would provide a reasonably comprehensive examination of several factors affecting the efficiency of straw recovery and relating it to easily obtained (m^2) data. As well, an effort will be made to find what reasons may have led to differing straw availability results by different methods in the past.

2.3 General Description

2.3.1 Equipment

PAMI supplied a John Deere 7720 Titan II combine fitted with sample collection test equipment. The equipment sampled the grain going into the grain tank at the same time as the straw and chaff discharged from the combine were collected in separate bags. PAMI also supplied a John Deere 9600 for general harvesting of extra windrows. A Case 1680 and an International 1460 were rented for harvesting selected windrows. Both had a discharge beater rather than a straw chopper. PAMI supplied a David Brown tractor and a Case 1070 tractor to power the balers. A New Holland 271 square baler (small square bales) was rented as well as a Gehl Model RB1860 round baler (often referred to as either a variable chamber or hard-core baler). PAMI also provided a JCB loader for handling the round bales.

PAMI's grain truck was equipped with Mass Load Technologies scales supporting the box for weighing this harvested grain. A Prairie Systems (10,000 lb) platform scale on a trailer was used for weighing bales, and PAMI also provided a smaller scale and a Clipper fanning mill with a Massey rethresher for threshing and cleaning the grain samples. PAMI's drying oven was used to dry the m^2 samples.

2.3.2 Crops and Conditions

Two HRS wheat crops were used for the testing. One, referred to as HRS1, had a strong healthy stand of straw. The straw's average length was 0.9 m (36 in) plus the heads, with an average plant population of 543 plants per m^2. The as harvested grain yield was about 2.89 t/ha (43 bu/ac) at a moisture of 14.5%. The yield was fairly uniform with a standard deviation of about ±14%. The second HRS wheat crop, HRS2, was selected for its poor stand. The grain and straw yields were much lower than typical and were highly variable. The grain yield was only about 0.75 t/ha (11.1 bu/ac) with a standard deviation of ±50%. The straw length was about 0.6 m (20 in) and the plant density was only 284 plants per m^2.

The CPS wheat had a higher grain yield than the HRS1 at 3.9 t/ha (58 bu/ac) and was quite uniform with a standard deviation of ±7.8%. The straw was slightly shorter at 0.8m (32 in) in length below the heads and the mean plant population was 432 plants per m^2.

The crops were dry or near dry at the time of harvest. The grain moisture for HRS1 was 13.2%, HRS2 was 14.8% and CPS was 14.9%. The straw moistures were 7.7% and 7.2% for HRS1 and HRS2 respectively and 6.3% for CPS. In contrast the whole crop moisture content for the m^2 samples which were taken up to one week before harvest averaged 28.8% for HRS1 and 32.6% for CPS.

2.3.3 Procedure

There were eight, 1 m^2 samples taken from each field. These samples were roughly located at one third and two thirds of the way across the width of the test plot and at 1/5, 2/5, 3/5 and 4/5 along the length of the plot. The exact spot was randomly selected within the general target area. A sample area was laid out in a one metre square (1 m x 1 m) that aligned with the direction of crop rows. The crop was hand cut as close to the ground as physically possible. The entire plants were placed in a bundle that was then put into a burlap sack, and tagged for identification. As soon as the eight samples were collected they were weighed. These samples were hung in a well-ventilated area until they could be dried. The samples were placed in an oven at 100° C for a minimum of 24 hours. The samples were again weighed and moisture contents calculated.

The heads were removed from the rest of the plant. These heads were weighed and then threshed in a modified rethresher from a Massey Ferguson 860 combine. The rethresher speed was set at 480 rpm to ensure that grain was not damaged and lost. This meant that the sample had to be threshed and cleaned three times to achieve complete threshing. The clean grain was weighed and subtracted from the whole head weight. This left the difference as chaff, which was only the material-other –than grain in the head.

The individual plants were counted and an average length of straw estimated for the majority of stems without the heads attached. The bundle of full-length straw was weighed. The stems were tapped on a flat surface to get the majority of the straws aligned with each other at the base. Three cuts of 10 cm (3.9 in) were taken from the base of the straw bundle. Each section was weighed individually. From this data, dry mass yields for grain, chaff and the different lengths of straw were calculated for each sample.

By determining the mass of a 10 cm section, an estimate of straw yield was calculated. This provided straw yields that could be used for comparison to combine grain and straw results for a particular stubble height.

The combine collections were done using the John Deere 7720 Titan II. In its grain tank, the fill auger was fitted with a diverter, which shifted the grain flow from the grain tank into a sample bin supported on a load cell. At the rear of the combine, a cart was attached to the rear axle in two places. The cart rode on three castor wheels so that it followed the combine. This cart held two sets of conveyors. One set of conveyors consisted of a reversing flat conveyor, which carried straw either onto the ground or to an elevating conveyor, which in turn carried the straw up and into a collection bag. The second set of conveyors ran in line with the combine and carried the chaff rearward and up an elevating conveyor. When a collection was triggered, a bag was opened into the chaff stream for the same length of time that the straw and grain were collected. The collection time and distance were measured.

In the selected test windrows the combine was operated at about the same speed for all collections. First, the combine was allowed to stabilize and then a collection was made. The collections typically lasted about 6 to 7 seconds while the crop from a distance of 5 m of travel was collected. The grain, chaff and straw collected were weighed and used to calculate yields. The collections were repeated along the entire length of the test plot windrows.

The remaining windrows in the test plot were combined using either a conventional or rotary combine. The straw was dropped into windrows for baling and the grain from each windrow was weighed in the grain truck.

The JD 7720 Titan II was used to combine the remaining "conventional" windrows in HRS1 and HRS2. The JD 9600 was used to combine the "conventional" windrows in CPS. The Case IH 1680 was used to harvest the "rotary" windrows in the HRS1 and CPS while the International 1460 was used for the "rotary" windrows in HRS2. The settings used were as indicated in PAMI reports for that particular model or a similar model.

The windrows from the combines were baled using either a square baler (small bales) or a round baler. Most of the windrows were baled the same day as they were harvested. Some were left for 5 days and other for 10 days before they were baled. The bales were weighed on the platform scale.

2.4 Scope of Test

The testing included three test crops in the Humboldt area. Two were AC Barrie Hard Red Spring (HRS) wheat, and the other was AC Crystal Canada Prairie Spring (CPS) wheat. The m^2 samples were taken from each crop prior to windrowing. The entire plants within the sample were cut at ground level and placed in burlap bags. Right after collection each bagged sample was weighed. These samples were then stored for processing later.

The two HRS wheat crops were windrowed by the farmer/owner. PAMI swathed the CPS crop to obtain a cut width that better suited the equipment that was available for harvesting and baling. Test windrows were flagged and harvesting took place once the crop was dry enough to harvest. Out of the group of test windrows, two were harvested using a PAMI combine fitted with the batch collection equipment, which allowed simultaneous sampling of grain, straw and chaff. The collection time and distance were measured. The remainders of the windrows were harvested with the test combine, or a similar conventional combine, and a rotary combine. Grain from each windrow was weighed and the straw was baled and weighed.

The m^2 samples that were collected were dried and processed. The heads were removed and threshed. The straw was weighed at various lengths.

The data from the different treatments was compared.

2.5 Results and Discussion

2.5.1 Test Results

The test results are shown in **Appendix I**. **Table 1** shows the results for the three test plot meter-square samples. **Tables 2** to **4** show the combine test results from the test plots and **Tables 5** to **7** show the baling results.

2.5.2 Discussion of Results

The metre-square results provided the most complete data. The samples were taken at crop moistures, which minimized the chance of significant natural loss. The processing technique also provided a relatively complete understanding of the division of the materials that make up the entire plant. By separating the heads and processing them separately an accurate measurement of true chaff was obtained. As well, by determining the mass of specific lengths of straw near the base of the stems, a better understanding was developed as to how much cutting height affected the amount of straw available for use after harvest. An improvement to this procedure could be made by separating the heads at collection time and then weighing and drying them separately to better define the differences between whole crop moisture and grain, chaff and straw moisture.

These results are useful in that they show that this relatively simple sampling technique offers a basis for predicting how much straw is available. The results can then be used to develop guidelines for harvesting that would provide a balance between maximum straw retrieval versus straw retained for other reasons. The results also provided many interesting relationships between the various plant fractions.

The objective was to determine the straw recovery relationship to grain yield. However, for a control basis it was also important to first compare the various collection methods to determine if they provided similar grain yield data.

Generally the grain yields for the different sampling methods produced an acceptable variance in the HRS1 and CPS wheat crops. In the HRS1 tests, the combine collection results were 2.4% lower than the m^2 samples and the complete windrow measurements were 10.2% lower. Similarly in the CPS test the combine yield measurements were 0.6% higher than the m^2 yield, while the full windrow tests were 3.6% lower. This range of difference is appropriate considering the variables such as natural loss, machine loss, and variations produced through yield variation by area. A safe assumption is that yield

measurements will likely be 90% accurate for good crop stands. If straw production is to be taken from delivered grain to terminals or reported overall yields then some adjustment should be made to incorporate the inherent difference between grain available and harvested grain (i.e. m^2 samples vs. combine collection).

The comparison of how much straw a crop produces versus how much goes through the combine and how much can be baled is quite different. In the HRS1 and CPS crops, the amount of straw that came out of the combine as compared to the total straw produced by the crop was just over 60% for both crops. In the poor HRS2 crop that amount dropped below 40%.

The poor HRS crop at Plunkett results show a major difference between the m^2 samples and the combine samples and whole windrow measurements. These two methods indicated a grain yield that was 46.9 and 43.8% lower. This crop was selected because it was a very poor stand. It was also highly variable. The result of this was that when harvesting it was impossible to get the crop into the combine and many heads on short straw were never picked. The positive side to this testing was that the combine collection grain yield results were still within 6% of the whole windrow results.

Where did the straw go? Obviously a significant portion of the straw stayed in the field as stubble. Determining an accurate stubble height is very difficult. Not only does the header height vary over a field as the height is adjusted from time to time, but it also varies with direction of travel, field undulations and forward speed. It is easily observed that within a group of plants in a single "bunch", that there is a noticeable difference in the stubble height. This occurs because of the interaction between forward travel and the time it takes the knife to cut the crop. It is also generally accepted that some straw is converted into chaff.

At this time it would be presumptuous to try to draw conclusions about how much straw loss might have occurred during the combining operation. The results indicate that the straw yield from the combine collections falls within the range of straw yields calculated for the m^2 results when 20 to 30 cm of straw had been removed. However, the estimated stubble height suggests that some straw may have been lost, but no measurement accurately accounts for this. The chaff to straw ratios for the combine test results and those of the m^2 results also show the same trend as the straw, matching the results for stubble heights between 20 and 30 cm. This was not the case for HRS2, which is understandable since there appeared to be a major difference in the amount of crop retrieved as compared to that which was grown.

Perhaps more surprising results were that the amount of straw recovered through baling was considerably less than the straw yield measured from the combine collection data. In HRS1, on average only 77% was recovered. In the CPS this was even lower at 66%. Compared to the amounts grown the baled amounts represents about 47% in HRS1 and 40% in CPS. The question again is where did the straw go? No heavy rain was encountered between combining and baling and the picking job done by the balers was not worse than would normally be expected with good windrows and when baling right after combining.

In the HRS1 the loss does not appear to be high when comparing the baled recovery rate for the combination of conventional combine and square baler. In this case the recovery rate is about 90%. It drops to about 85% for a conventional combine and round baler. The results drop to about 53% for a rotary combine and square baler, while the round baler could not bale the straw from the rotary combine. A 10 to 15% loss seems probable. Some straw may have been lost during baling, and some of the straw from the combine may have been chaff entrapped in the straw.

In CPS wheat, the difference between the combine and baler combination was about the same for a conventional combine with either the square baler or round baler. Still the recovery rate was less than 70%. This recovery got worse when using a rotary combine. One possible explanation is that in this crop considerably more of the chaff stayed with the straw, or that the straw was much more pulverized by the threshing operation. This loss is enough to warrant further investigation because it would appear that CPS straw would be a poor candidate as a straw supply source. It should be noted that harvest conditions were typical for Humboldt area but in drier, hotter harvest conditions or with rain after combining, recovery may be reduced further.

Once again HRS2 was contrary to the trend shown by the other two crops. When compared to the straw yield from the combine the straw recovery yield was slightly higher. This suggested that all straw from the conventional combine was recovered with the balers. Straw yield recovered from the rotary combine was slightly less than the yield from the combine collections. This can be explained to some extent in that straw from lower yielding crops appears "clean" which results from little chaff being trapped in the straw. In this way a truer straw yield was measured by using the combine collection equipment as little chaff was entrapped in the straw.

As discussed in the previous paragraphs, the combine and baler type of combination did appear to have had an effect on the straw recovery efficiency. The limited number of comparisons make it inappropriate to compare specific results. The most noticeable trend was that the rotary combine and round baler combination used were the least successful. At times no straw could be recovered and in all cases the straw yield was noticeably lower. Similarly the results using a square baler in conjunction with a rotary

combine produced less recovered straw than with a conventional combine. The bales were also more difficult to handle. This is not to say that different combinations or other makes of combines and balers would not produce suitable results. Specific combinations would have to be tried and compared to be able to determine a relative efficiency.

The other variable that was included in the experiments was time after harvest until the straw was baled. In the three trials conducted there were no major trends indicating a difference that could not be attributed to normal variation in yield between windrows. This suggests that time after harvest is not significant if no rainfall occurs before baling.

3. Conclusions and Recommendations

The tests were a valuable experiment for indicating similarities and differences in yield and other data that the sampling methods produce. In the past, whenever such results did not correspond with each other it was assumed that the differences resulted from variations in crop or the method of sampling used. By comparing the results of each method in the same test plot, many of the prior concerns about different values of straw availability from previous tests can be accounted for. It should be noted that these tests in this project were all done in dry conditions that generally represent the majority of typical harvest conditions.

Firstly with reasonably good crop stands, all methods of testing grain yield provided average grain yield data that was within 10% of the highest obtained results. This leads us to believe that each of the sampling methods must have reasonably accounted for the normal variations within the plot. A higher precision may not be possible particularly if there is high yield variability.

The height of stubble has a major effect upon the amount of straw available for harvest. The amount of this effect is considerably more than the ratio of the stubble length as a percentage of the total straw length. It also is probably the largest controllable factor in baleable straw availability. For example, 30 cm represented 32%, 37% and 49% of the total straw length of HRS1, CPS and HRS2. The bottom 30-cm of straw represented 43%, 51% and 66% of the total straw yield for those crops.

The results suggest that if an accurate stubble height can be estimated then the straw yield from a combine can be determined relatively closely by relationships with yield by m^2 or from combined yield. This method will not totally account for the straw that may be turned into chaff in some crops while in others some of the straw may actually be a portion of the chaff from the plant. This will vary with combine type, combine adjustment and crop conditions.

The relationship between the straw yield measured in m^2 samples compared to that which was measured through combine samples is less important than the relationships of the baled straw recovery to yield. These tests indicated that significantly less straw was recovered than was grown, and that in some cases it may be considerably less than the straw that was even discharged from the combine. In good crop stands, using typical cutting heights, the straw recovered through baling may be only 40% of the total straw yield in CPS and slightly less than 50% in hard red spring wheat. In poor stands of hard red spring wheat, the baled straw may represent less than 40% of the straw grown.

The selection of the combine and baler combination is important. Conventional combines tend to a leave a straw that can be baled by either a square or round baler, with no major differences in recovery rates. A rotary combine tends to leave less straw and at times that straw can be unbaleable with some types of round balers.

The time after combining appeared to have little effect upon the recovery rate of straw with a baler but in these tests, rain did not occur during the elapsed time.

Further studies would be useful to determine the relationship between yield and available straw in other crops. As well, further investigation would be useful for determining where the loss between the combine straw yield and baled straw yield is occurring. It may be either due to the composition of the straw from the combine or to losses that occur during the baling process.

If studies were carried out in the future using m^2 sampling, a valuable modification would be to remove the heads at sample time so that the grain and straw moisture can be determined separately. Straw moisture would be expected to affect baleability and also must have an effect on chaff production.

7. Acknowledgements

A progress update from this project and the other two associated projects were presented at the Agriculture and Greenhouse Gas Climate Change Workshop in late 2000.

Appendix I

Test Results

A complete electronic copy of the data gathered for this project is provided on the disk included with this report.

Table 1. Test Results from Square Metre Samples.

Field Data

AC BARRIE - Hard Red Spring Wheat 1 — September 2001 — Humboldt Saskatchewan

Sample Location #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
HUM1-1	1746	1371	607.2	299.3	188.6	91	495	63.2	63.1	60.4
HUM1-2	2000	1646	698.1	391.2	261.0	93	589	73.0	76.1	72.2
HUM1-3	2088	1667	818.9	412.6	291.1	92	595	79.1	78.8	70.4
HUM1-4	1473	1304	598.6	323.5	213.3	90	462	47.0	63.3	58.9
HUM1-5	1621	1329	667.9	398.8	272.1	88	472	53.4	60.5	60.3
HUM1-6	1990	1686	806.6	417.5	289.2	93	647	78.9	83.3	75.1
HUM1-7	1880	1541	752.1	398.8	268.3	89	606	74.7	77.3	68.2
HUM1-8	1783	1429	814.1	384.4	260.0	92	578	72.4	68.9	68.6
Average	1824	1470	754.2	398.0	248.2	92	543	68.1	71.0	66.1
Std Dev	214	168	79.9	46.0	34.1	2	63	11.3	8.3	6.9

Calculations

AC BARRIE - Hard Red Spring Wheat 1 — September 2001 — Humboldt Saskatchewan

Sample Location #	Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG/Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG YIELD for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / Mog for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
HUM1-1	34.4	4.15	3.51	2.89	2.28	1.89	32.8	1.11	16.2	16.0	15.7	15.4	5.25	4.62	3.99	3.39	0.21	0.24	0.28	0.33
HUM1-2	34.5	5.27	4.54	3.78	3.05	2.61	45.4	1.30	16.6	16.4	16.1	15.9	6.57	5.84	5.08	4.36	0.20	0.22	0.26	0.30
HUM1-3	36.1	5.26	4.46	3.68	2.97	2.81	48.9	1.32	18.2	18.0	17.7	17.5	6.57	5.78	4.99	4.29	0.20	0.23	0.26	0.31
HUM1-4	19.1	3.92	3.45	2.82	2.23	2.13	37.1	1.10	18.4	18.2	17.9	17.7	5.02	4.55	3.92	3.33	0.22	0.24	0.28	0.33
HUM1-5	25.1	3.92	3.39	2.78	2.18	2.21	38.5	1.08	19.4	19.2	18.9	18.6	5.00	4.47	3.86	3.26	0.22	0.24	0.28	0.33
HUM1-6	29.3	5.63	4.82	3.99	3.24	2.80	48.8	1.37	16.8	16.6	16.3	16.1	6.99	6.19	5.36	4.61	0.20	0.22	0.26	0.30
HUM1-7	27.4	5.26	4.50	3.77	3.11	2.68	46.2	1.28	16.8	16.5	16.1	15.9	6.63	5.78	5.05	4.39	0.20	0.22	0.25	0.29
HUM1-8	24.1	4.79	4.04	3.34	2.69	2.50	44.1	1.27	18.6	18.3	18.0	17.8	6.06	5.32	4.62	3.96	0.21	0.24	0.28	0.32
Average	28.8	4.77	4.09	3.38	2.72	2.46	42.9	1.23	17.6	17.4	17.1	16.8	6.00	5.32	4.61	3.95	0.21	0.23	0.27	0.31
Std Dev	6.0	0.89	0.67	0.49	0.43	0.34	5.8	0.11	1.2	1.2	1.2	1.2	0.40	0.68	0.50	0.65	0.01	0.01	0.01	0.02

Field Data

AC Crystal - Canada Prairie Spring Wheat — September 2001 — Humboldt Saskatchewan

Sample #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
HUM2-1	2112	1541	600.8	519.1	374.7	83	433	76.8	75.7	72.2
HUM2-2	1978	1530	638.7	474.3	336.7	81	445	82.3	76.1	72.2
HUM2-3	1830	1520	686.0	488.3	334.8	81	506	80.2	81.6	76.8
HUM2-4	1627	1383	694.2	430.0	299.3	78	383	60.5	66.2	63.2
HUM2-5	1993	1472	646.5	461.1	330.0	79	404	53.6	67.4	62.3
HUM2-6	1862	1592	632.4	476.6	314.3	79	442	66.4	76.5	66.1
HUM2-7	1930	1486	616.6	455.4	318.4	83	414	47.2	74.8	67.2
HUM2-8	2129	1516	589.7	523.8	386.7	81	431	72.5	70.3	64.3
Average	1929	1491	611.9	478.6	333.0	81	432	62.3	73.6	67.9
Std Dev	164	84	27.3	31.6	29.9	2	37	8.7	5.2	5.1

Calculations

AC Crystal - Canada Prairie Spring Wheat — September 2001 — Humboldt Saskatchewan

Sample #	Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG/Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG Yield for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / Mog for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
HUM2-1	37.8	4.21	3.44	2.69	1.98	3.75	66.2	1.44	35.3	35.0	34.6	34.2	5.65	4.89	4.13	3.41	0.26	0.30	0.35	0.42
HUM2-2	33.5	4.18	3.54	2.78	2.05	3.27	58.9	1.48	29.7	29.4	29.0	28.7	5.64	5.01	4.25	3.53	0.26	0.29	0.35	0.42
HUM2-3	24.5	4.36	3.76	2.94	2.17	3.35	58.3	1.54	28.8	28.6	28.2	27.8	5.89	5.29	4.47	3.71	0.26	0.29	0.34	0.41
HUM2-4	23.6	3.59	2.96	2.32	1.69	2.98	51.9	1.32	32.9	32.5	32.1	31.7	4.91	4.30	3.64	3.01	0.27	0.31	0.36	0.44
HUM2-5	38.7	3.65	3.12	2.44	1.82	3.30	57.4	1.31	33.5	33.3	32.9	32.5	4.97	4.43	3.76	3.13	0.26	0.30	0.35	0.42
HUM2-6	28.7	3.93	3.28	2.51	1.86	3.14	54.7	1.62	31.5	31.2	30.8	30.4	5.56	4.90	4.13	3.48	0.29	0.33	0.39	0.47
HUM2-7	34.9	3.93	3.46	2.71	2.04	3.18	55.4	1.37	29.1	28.9	28.5	28.2	5.30	4.83	4.08	3.41	0.26	0.28	0.34	0.40
HUM2-8	39.3	4.23	3.50	2.80	2.15	3.67	63.8	1.57	31.6	31.3	30.9	30.6	5.80	5.07	4.37	3.73	0.27	0.31	0.36	0.42
Average	32.6	4.01	3.38	2.65	1.97	3.33	58.0	1.46	31.6	31.3	30.9	30.5	5.46	4.84	4.10	3.42	0.27	0.30	0.35	0.43
Std Dev	6.3	0.28	0.25	0.21	0.17	0.26	4.6	0.12	2.3	2.3	2.3	2.2	0.37	0.33	0.29	0.25	0.01	0.01	0.02	0.02

Field Data

AC Barrie - Hard Red Spring Wheat 2 — September 2001 — Plunket Saskatchewan

Sample Location #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
PLUNK-1	N/A	728	323.4	127.2	47.6	66	324	43.0	52.5	51.0
PLUNK-2	N/A	662	339.0	100.8	28.5	63	318	34.3	41.0	42.1
PLUNK-3	N/A	445	318.0	63.5	38.3	52	111	13.7	14.4	12.2
PLUNK-4	N/A	634	330.1	117.8	47.5	57	292	38.4	41.4	38.1
PLUNK-5	N/A	732	333.4	190.8	111.9	64	348	38.1	44.2	40.2
PLUNK-6	N/A	622	362.9	198.0	109.6	69	349	46.1	52.3	49.8
PLUNK-7	N/A	526	344.9	94.7	51.2	58	229	20.7	21.3	21.8
PLUNK-8	N/A	638	332.5	134.7	74.6	63	302	27.4	34.4	31.6
Average	N/A	649	334.3	128.4	63.9	61	284	32.7	37.7	35.9
Std Dev	N/A	119	17.3	47.3	29.2	5	80	9.2	11.2	10.4

Calculations

AC Barrie - Hard Red Spring Wheat 2 — September 2001 — Plunket Saskatchewan

Sample Location #	Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG / Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG Yield for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / MOG for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
PLUNK-1	N/A	2.77	2.34	1.82	1.31	0.48	8.3	0.60	8.4	8.1	7.7	7.3	3.57	3.14	2.62	2.11	0.22	0.25	0.30	0.36
PLUNK-2	N/A	2.72	1.98	1.47	1.05	0.30	5.1	0.71	7.0	6.7	6.3	6.0	2.94	2.59	2.18	1.76	0.24	0.28	0.33	0.40
PLUNK-3	N/A	0.64	0.50	0.35	0.23	0.39	6.8	0.24	32.2	31.6	31.0	30.5	0.88	0.74	0.60	0.47	0.28	0.33	0.41	0.51
PLUNK-4	N/A	1.86	1.48	1.06	0.68	0.48	8.3	0.70	14.9	14.3	13.7	13.1	2.58	2.18	1.77	1.39	0.27	0.32	0.40	0.51
PLUNK-5	N/A	2.08	1.70	1.26	0.85	1.12	19.5	0.79	25.3	24.8	24.3	23.8	2.87	2.49	2.04	1.64	0.28	0.32	0.39	0.48
PLUNK-6	N/A	2.71	2.25	1.73	1.23	1.10	19.1	0.88	17.7	17.4	16.9	16.5	3.60	3.13	2.61	2.11	0.25	0.28	0.34	0.42
PLUNK-7	N/A	0.88	0.68	0.46	0.25	0.51	8.9	0.44	39.8	39.0	38.1	37.2	1.32	1.11	0.90	0.68	0.33	0.38	0.48	0.64
PLUNK-8	N/A	1.71	1.43	1.09	0.77	0.75	13.0	0.60	19.0	18.6	18.2	17.8	2.31	2.04	1.69	1.39	0.26	0.30	0.35	0.44
Average	N/A	1.86	1.53	1.16	0.80	0.64	11.1	0.66	20.5	20.1	19.5	19.0	2.50	2.18	1.80	1.44	0.27	0.31	0.37	0.47
Std Dev	N/A	0.79	0.67	0.54	0.41	0.32	5.5	0.19	11.7	11.7	11.5	10.8	0.88	0.79	0.71	0.61	0.03	0.04	0.06	0.08

Table 2. Combine Collection Results for HRS1.

COMBINE COLLECTION RESULTS

HRS WHEAT #1	HUMBOLDT								SEP 14, 2000	HRS WHEAT # 1	HUMBOLDT								SEP 14, 2000	ALL RUNS	
	WINDROW #4									WINDROW #7											
RUN #	1	2	3	4	5	6	7	8	Mean	9	10	11	12	13	14	15	16	Mean	Mean	Std Dev
SWATH CUT WIDTH (ft)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5		19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5			
DISTANCE COUNT	76	75	96	96	96	96	96	96		95	96	96	96	96	96	96	96			
COLLECTION DISTANCE (ft)	13.1	12.9	16.6	16.6	16.6	16.6	16.6	16.6		16.4	16.6	16.6	16.6	16.6	16.6	16.6	16.6			
COLLECTION TIME (sec)	5.14	5.06	6.73	6.62	6.41	6.19	6.24	6.43		6.34	6.58	6.26	6.41	6.17	6.4	6.42	6.14			
COLLECTION AREA (sq ft)	255.6	252.3	322.9	322.9	322.9	322.9	322.9	322.9		319.6	322.9	322.9	322.9	322.9	322.9	322.9	322.9			
COLLECTION AREA (sq m)	23.7	23.4	30.0	30.0	30.0	30.0	30.0	30.0		29.7	30.0	30.0	30.0	30.0	30.0	30.0	30.0			
CHAFF, MASS (kg)	3.71	4.3	4.64	4.74	4.24	4.34	4.44	6.34		4.94	4.84	3.64	4.44	4.44	4.14	4.64	4.14			
CHAFF, MASS (lb)	8.18	9.48	10.23	10.45	9.35	9.57	9.79	13.98		10.89	10.67	8.02	9.79	9.79	9.13	10.57	9.13			
STRAW MASS (kg)	6.1	7.4	10.4	9.5	9.3	8.1	10.1	8.3		10.1	10.1	7.2	10.7	8.5	9.9	12.7	9.2			
STRAW MASS (lb)	13.45	16.31	22.93	20.94	20.50	17.86	22.27	18.30		22.27	22.27	15.87	23.59	18.74	21.83	28.09	20.28			
GRAIN MASS (kg)	6.2	6.6	8.9	8.7	8.8	8.3	8.5	8.7		8.9	8.5	7.1	8.9	6.5	8.1	8.4	8.2			
GRAIN MASS (lb)	13.67	14.55	19.62	19.18	19.40	18.30	18.74	19.18		19.62	18.74	15.65	19.62	14.33	17.86	18.52	18.08			
GRAIN MOISTURE (%)	13.1	13	13.2	13.1	13.0	13.1	13.1	13.1	13.1	13.1	13.2	13.3	13.2	13.2	13.3	13.1	13	13.2	13.15	0.12
STRAW MOISTURE (%)	7.5	7.7	7.9	7.9	7.6	7.9	8.2	7.5	7.81	7.7	7.7	7.7	8.4	8.2	7.7	7.4	7.2	7.9	7.68	0.54
CHAFF YIELD (t/ha)	1.38	1.47	1.55	1.58	1.41	1.45	1.48	2.11	1.55	1.66	1.61	1.21	1.48	1.48	1.36	1.61	1.36	1.48	1.51	0.20
CHAFF YIELD (lb/ac)	1232	1311	1381	1410	1258	1293	1320	1886	1381	1480	1439	1082	1320	1323	1214	1438	1214	1330	1351	175
STRAW YIELD (t/ha)	2.57	3.16	3.47	3.17	3.10	2.70	3.37	2.77	3.04	3.40	3.37	2.40	3.57	2.83	3.30	4.23	3.07	3.31	3.15	0.45
STRAW YIELD (lb/ac)	2291	2817	3093	2825	2766	2409	3004	2468	2709	3035	3004	2141	3182	2528	2944	3777	2736	2918	2814	399
GRAIN YIELD (t/ha)	2.61	2.82	2.97	2.90	2.93	2.77	2.83	2.90	2.84	3.00	2.83	2.37	2.97	2.17	2.70	2.80	2.73	2.70	2.77	0.22
GRAIN YIELD (lb/ac)	2329	2512	2647	2587	2617	2468	2528	2587	2534	2675	2528	2111	2647	1933	2409	2498	2439	2405	2470	201
GRAIN YIELD (bu/ac) @60 lb/bu	38.8	41.9	44.1	43.1	43.6	41.1	42.1	43.1	42.2	44.6	42.1	35.2	44.1	32.2	40.1	41.6	40.6	40.1	41.16	3.35
MOG/GRAIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.18
STRAW/GRAIN	0.98	1.12	1.17	1.09	1.06	0.97	1.19	0.96	1.07	1.13	1.19	1.01	1.20	1.31	1.22	1.51	1.13	1.24	1.14	0.14
CHAFF/MOG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
CHAFF/STRAW	0.54	0.47	0.45	0.50	0.46	0.54	0.44	0.76	0.52	0.49	0.48	0.51	0.42	0.52	0.41	0.38	0.44	0.46	0.49	0.09
CHAFF/GRAIN	0.59	0.59	0.52	0.57	0.52	0.59	0.52	0.73	0.58	0.56	0.57	0.51	0.50	0.68	0.50	0.52	0.45	0.55	0.55	0.07
CHAFF, MASS (kg) (adjusted)	3.00	3.19	4.27	4.39	3.92	3.94	4.08	5.86		4.56	4.50	3.37	4.08	4.08	3.84	4.48	3.84			
CHAFF, MASS (lb) (adjusted)	6.61	7.02	9.42	9.69	8.64	8.68	9.01	12.93		10.05	9.91	7.42	9.01	8.99	8.47	9.88	8.47			
STRAW MASS (kg) (adjusted)	5.64	6.85	9.58	8.81	8.59	7.35	9.29	7.68		9.32	9.38	6.66	9.84	7.80	9.19	11.76	8.54			
STRAW MASS (lb) (adjusted)	12.44	15.11	21.12	19.41	18.94	16.20	20.49	16.93		20.55	20.69	14.69	21.70	17.20	20.25	25.93	18.82			
GRAIN MASS (kg) (adjusted)	5.39	5.74	7.73	7.56	7.52	7.21	7.39	7.56		7.73	7.38	6.16	7.73	5.64	7.02	7.30	7.13			
GRAIN MASS (lb) (adjusted)	11.89	12.66	17.03	16.67	16.80	15.90	16.28	16.67		17.05	16.27	13.57	17.03	12.44	15.48	16.09	15.73			
CHAFF, YIELD (t/ha) (adjusted)	1.26	1.36	1.46	1.31	1.31	1.36	1.96	2.63		1.54	1.50	1.12	1.36	1.36	1.28	1.49	1.28			
CHAFF, YIELD (lb/ac) (adjusted)	1125.6	1212.6	1301.9	1165.6	1170.6	1214.8	1744.0	2348.3		1370.2	1337.2	1001.3	1214.8	1212.1	1142.5	1332.8	1142.5			
STRAW YIELD (t/ha) (adjusted)	2.38	2.92	3.19	2.94	2.86	2.45	3.10	2.56		3.14	3.13	2.22	3.28	2.60	3.06	3.92	2.85			
STRAW YIELD (lb/ac) (adjusted)	2119.6	2608.4	2848.5	2618.9	2555.5	2184.8	2763.3	2283.2	2472.9	2801.5	2790.4	1980.6	2927.5	2320.5	2732.2	3497.3	2539.0	2734.4	2404.9	355.2
GRAIN YIELD (t/ha) (adjusted)	2.27	2.45	2.58	2.52	2.54	2.40	2.46	2.52	2.47	2.61	2.46	2.05	2.58	1.88	2.34	2.43	2.38	2.34	2.40	0.20
GRAIN YIELD (lb/ac) (adjusted)	2329.0	2512.3	2646.7	2587.3	2617.0	2468.3	2527.8	2587.3	2534.5	2674.6	2527.8	2111.5	2646.7	1933.0	2408.8	2498.1	2438.6	2404.9	2470	201
MOG YIELD (t/ha)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.31	0.49
MOG YIELD (lb/ac)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3846	437
MOG/GRAIN (adjusted)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.17
STRAW/GRAIN (adjusted)	1.04	1.19	1.24	1.16	1.13	1.02	1.26	1.01	1.13	1.21	1.27	1.08	1.27	1.38	1.31	1.61	1.20	1.33	1.21	0.15
CHAFF/MOG (adjusted)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
CHAFF/STRAW (adjusted)	0.54	0.47	0.45	0.50	0.46	0.54	0.44	0.76	0.52	0.49	0.48	0.51	0.42	0.52	0.41	0.38	0.44	0.46	0.49	0.09
CHAFF/GRAIN (adjusted)	0.59	0.59	0.52	0.57	0.52	0.59	0.52	0.73	0.58	0.56	0.57	0.51	0.50	0.68	0.50	0.52	0.45	0.55	0.58	0.07

Table 1. Test Results from Square Metre Samples.

Field Data

AC BARRIE - Hard Red Spring Wheat 1 — September 2001 — Humboldt Saskatchewan

Sample Location #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry Mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
HUM1-1	1746	1371	667.2	299.3	188.6	91	495	63.2	63.1	60.4
HUM1-2	2030	1546	628.1	391.2	261.0	93	589	73.0	76.1	72.2
HUM1-3	2008	1557	618.9	412.6	281.1	92	565	79.1	78.8	70.4
HUM1-4	1473	1304	586.6	323.5	213.3	90	462	47.0	63.3	58.9
HUM1-5	1621	1379	657.9	328.8	221.1	85	472	53.4	60.5	60.3
HUM1-6	1990	1585	605.6	417.5	280.2	93	647	79.9	83.3	75.1
HUM1-7	1690	1541	622.9	393.0	264.3	89	566	74.7	73.3	66.2
HUM1-8	1744	1479	614.1	388.4	268.0	94	648	74.4	68.9	66.6
Average	1824	1470	624.2	369.0	246.2	92	543	68.1	71.0	66.1
Std Dev	214	106	25.9	45.0	34.1	4	63	12.3	8.3	6.0

Calculations

AC BARRIE - Hard Red Spring Wheat 1 — September 2001 — Humboldt Saskatchewan

Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG/Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG YIELD for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / Mog for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
34.4	4.15	3.51	2.88	2.28	1.89	32.8	1.11	16.2	16.0	15.7	15.4	5.25	4.62	3.99	3.39	0.21	0.24	0.28	0.33
34.5	5.27	4.54	3.78	3.05	2.61	45.4	1.30	16.6	16.4	16.1	15.9	6.57	5.84	5.08	4.36	0.20	0.22	0.26	0.30
36.1	5.26	4.46	3.68	2.97	2.81	48.9	1.32	18.2	18.0	17.7	17.5	6.57	5.78	4.99	4.29	0.20	0.23	0.26	0.31
19.1	3.92	3.45	2.82	2.23	2.13	37.1	1.10	18.4	18.2	17.9	17.7	5.02	4.55	3.92	3.33	0.22	0.24	0.28	0.33
25.1	3.92	3.39	2.78	2.18	2.21	38.5	1.08	19.4	19.2	18.9	18.6	5.00	4.47	3.86	3.26	0.22	0.24	0.28	0.33
29.3	5.62	4.82	3.99	3.24	2.80	48.8	1.37	16.8	16.6	16.3	16.1	6.99	6.19	5.36	4.61	0.20	0.22	0.26	0.30
27.5	5.25	4.50	3.77	3.11	2.66	46.2	1.28	16.6	16.3	16.1	15.9	6.53	5.78	5.05	4.39	0.20	0.22	0.25	0.29
24.2	4.79	4.04	3.34	2.69	2.59	45.1	1.27	18.6	18.3	18.0	17.8	6.06	5.32	4.62	3.86	0.21	0.24	0.28	0.32
28.8	4.77	4.09	3.38	2.72	2.46	42.9	1.23	17.6	17.4	17.1	16.8	6.00	5.32	4.61	3.95	0.21	0.23	0.27	0.31
6.0	0.68	0.57	0.49	0.43	0.34	5.9	0.11	1.2	1.2	1.2	1.2	0.80	0.68	0.60	0.55	0.01	0.01	0.01	0.02

Field Data

AC Crystal - Canada Prairie Spring Wheat — September 2001 — Humboldt Saskatchewan

Sample Sample #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry Mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
HUM2-1	2112	1541	600.8	519.1	374.7	83	433	76.8	75.7	72.2
HUM2-2	1978	1530	636.7	474.3	336.7	81	445	62.3	76.1	72.2
HUM2-3	1820	1520	596.0	486.3	334.8	81	506	60.2	81.6	76.8
HUM2-4	1627	1383	594.2	430.0	298.3	78	383	60.5	66.2	63.2
HUM2-5	1993	1472	645.5	461.1	330.0	79	404	53.6	67.4	62.3
HUM2-6	1852	1502	632.4	476.6	314.3	79	442	65.4	76.5	66.1
HUM2-7	1920	1466	616.6	466.4	318.4	83	414	47.2	74.8	67.2
HUM2-8	2129	1516	569.7	523.8	366.7	81	431	72.5	70.3	64.3
Average	1929	1491	611.9	478.6	333.0	81	432	62.3	73.6	67.9
Std Dev	164	61	26.2	31.6	25.89	2	39	8.5	6.2	5.2

Calculations

AC Crystal - Canada Prairie Spring Wheat — September 2001 — Humboldt Saskatchewan

Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG/Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG Yield for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / Mog for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
37.8	4.21	3.44	2.69	1.96	3.75	65.2	1.44	35.3	35.0	34.6	34.2	5.66	4.89	4.13	3.41	0.26	0.30	0.35	0.42
33.5	4.16	3.54	2.78	2.05	3.27	56.9	1.48	29.7	29.4	29.0	28.7	5.64	5.01	4.25	3.53	0.26	0.29	0.35	0.42
24.5	4.36	3.76	2.94	2.17	3.35	58.3	1.54	28.8	28.6	28.2	27.8	5.89	5.29	4.47	3.71	0.26	0.29	0.34	0.41
23.6	3.59	2.98	2.32	1.69	2.98	51.9	1.32	32.9	32.5	32.1	31.7	4.91	4.30	3.64	3.01	0.27	0.31	0.36	0.44
38.7	3.65	3.12	2.44	1.82	3.30	57.4	1.31	33.5	33.3	32.9	32.5	4.97	4.43	3.76	3.13	0.26	0.30	0.35	0.42
28.7	3.93	3.28	2.51	1.86	3.14	54.7	1.62	31.5	31.2	30.8	30.4	5.55	4.90	4.13	3.48	0.29	0.33	0.39	0.47
34.9	3.93	3.46	2.71	2.04	3.18	55.4	1.37	29.1	28.9	28.5	28.2	5.30	4.83	4.08	3.41	0.26	0.28	0.34	0.40
33.3	4.23	3.50	2.80	2.15	3.67	63.8	1.57	31.6	31.3	30.9	30.6	5.80	5.07	4.37	3.73	0.27	0.31	0.36	0.42
32.6	4.01	3.38	2.65	1.97	3.33	58.0	1.46	31.6	31.3	30.9	30.5	5.46	4.84	4.10	3.42	0.27	0.30	0.35	0.43
6.3	0.26	0.25	0.21	0.17	0.26	4.6	0.12	2.3	2.3	2.2	2.2	0.37	0.33	0.29	0.25	0.01	0.01	0.02	0.02

Field Data

AC Barrie - Hard Red Spring Wheat 2 — September 2001 — Plunket Saskatchewan

Sample Location #	Sample Wet Mass (grams)	Sample Dry Mass (grams)	Bag Dry mass (grams)	Heads Dry Mass (grams)	Grain Dry Mass (grams)	Straw Length (cm)	Plant Population (# sq m)	Straw Cuttings from Base 1st 10 cm (grams)	2nd 10 cm (grams)	3rd 10 cm (grams)
PLUNK-1	N/A	728	323.4	127.2	47.6	65	324	43.0	52.5	51.0
PLUNK-2	N/A	662	339.0	100.8	29.5	63	318	34.3	41.0	42.1
PLUNK-3	N/A	445	318.0	63.5	39.3	52	111	13.7	14.4	12.2
PLUNK-4	N/A	634	330.1	117.8	47.5	57	292	38.4	41.4	38.1
PLUNK-5	N/A	732	333.4	190.8	111.9	64	348	38.1	44.2	40.2
PLUNK-6	N/A	822	352.9	198.0	109.6	69	349	46.1	52.3	49.8
PLUNK-7	N/A	528	344.9	94.7	51.2	58	229	20.7	21.3	21.8
PLUNK-8	N/A	638	332.5	134.7	74.6	63	302	27.4	34.4	31.6
Average	N/A	649	334.3	128.4	63.9	61	284	32.7	37.7	36.9
Std Dev	N/A	119	11.3	48.3	31.8	6	80	11.2	13.7	13.4

Calculations

AC Barrie - Hard Red Spring Wheat 2 — September 2001 — Plunket Saskatchewan

Sample Moisture (%)	Straw Yield (dry) for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Grain Yield (Dry) (t/ha)	Grain Yield-14.5% (bu/ac)	Chaff Yield (Dry) (t/ha)	MOG / Grain for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio	MOG Yield for Cut Height 0 cm (t/ha)	10 cm (t/ha)	20 cm (t/ha)	30 cm (t/ha)	Chaff / MOG for Cut Height 0 cm ratio	10 cm ratio	20 cm ratio	30 cm ratio
N/A	2.77	2.34	1.82	1.31	0.48	8.3	0.00	8.4	8.1	7.7	7.3	3.57	3.14	2.62	2.11	0.22	0.25	0.30	0.38
N/A	2.22	1.88	1.47	1.05	0.30	5.1	0.71	7.0	6.7	6.3	5.9	2.94	2.59	2.18	1.76	0.24	0.28	0.33	0.40
N/A	0.64	0.50	0.35	0.23	0.39	6.8	0.24	32.2	31.6	31.0	30.5	0.88	0.74	0.60	0.47	0.28	0.33	0.41	0.51
N/A	1.86	1.48	1.06	0.68	0.48	8.3	0.70	14.9	14.3	13.7	13.1	2.56	2.18	1.77	1.39	0.27	0.32	0.40	0.51
N/A	2.08	1.70	1.26	0.85	1.12	19.5	0.79	25.3	24.8	24.3	23.8	2.87	2.49	2.04	1.64	0.28	0.32	0.39	0.48
N/A	2.71	2.25	1.73	1.23	1.10	19.1	0.88	17.7	17.4	16.9	16.5	3.60	3.13	2.61	2.11	0.25	0.28	0.34	0.42
N/A	0.88	0.69	0.46	0.25	0.51	8.9	0.44	39.8	39.0	38.1	37.2	1.32	1.11	0.90	0.68	0.33	0.39	0.48	0.64
N/A	1.71	1.43	1.09	0.77	0.75	13.0	0.60	19.0	18.6	18.2	17.8	2.31	2.04	1.89	1.38	0.26	0.30	0.36	0.44
N/A	1.86	1.53	1.16	0.80	0.64	11.1	0.66	20.5	20.1	19.5	19.0	2.50	2.18	1.80	1.44	0.27	0.31	0.37	0.47
N/A	0.78	0.67	0.54	0.41	0.32	5.5	0.21	11.4	11.2	11.1	10.9	0.98	0.87	0.74	0.60	0.03	0.04	0.06	0.09

Table 2. Combine Collection Results for HRS1.

COMBINE COLLECTION RESULTS

HRS WHEAT #1	HUMBOLDT									SEP 14, 2000	HRS WHEAT # 1	HUMBOLDT								SEP 14, 2000
	WINDROW #6										WINDROW #7									ALL RUNS
RUN #	1	2	3	4	5	6	7	8	Mean		9	10	11	12	13	14	15	16	Mean	Mean	Std Dev
SWATH CUT WIDTH (ft)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5			19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5			
DISTANCE COUNT	76	75	96	96	96	96	96	96			95	96	96	96	96	96	96	96			
COLLECTION DISTANCE (ft)	13.1	12.9	16.6	16.6	16.6	16.6	16.6	16.6			16.4	16.6	16.6	16.6	16.6	16.6	16.6	16.6			
COLLECTION TIME (sec)	5.14	5.06	6.73	6.62	6.41	6.19	6.24	6.43			6.34	6.58	6.26	6.41	6.17	6.4	6.42	6.14			
COLLECTION AREA (sq ft)	255.6	252.3	322.9	322.9	322.9	322.9	322.9	322.9			319.6	322.9	322.9	322.9	322.9	322.9	322.9	322.9			
COLLECTION AREA (sq m)	23.7	23.4	30.0	30.0	30.0	30.0	30.0	30.0			29.7	30.0	30.0	30.0	30.0	30.0	30.0	30.0			
CHAFF MASS (kg)	3.24	3.44	4.64	4.74	4.24	4.34	4.44	6.34			4.94	4.84	3.64	4.44	4.44	4.14	4.84	4.14			
CHAFF MASS (lb)	7.14	7.58	10.23	10.45	9.35	9.57	9.79	13.98			10.89	10.67	8.02	9.79	9.79	9.13	10.67	9.13			
STRAW MASS (kg)	6.1	7.4	10.4	9.5	9.3	8.1	10.1	8.3			10.1	10.1	7.2	10.7	8.5	9.9	12.7	9.2			
STRAW MASS (lb)	13.45	16.31	22.93	20.94	20.50	17.86	22.27	18.30			22.27	22.27	15.87	23.59	18.74	21.83	28.00	20.28			
GRAIN MASS (kg)	6.2	6.6	8.9	8.7	8.8	8.3	8.5	8.7			8.9	8.5	7.1	8.9	6.5	8.1	8.4	8.2			
GRAIN MASS (lb)	13.67	14.55	19.62	19.18	19.40	18.30	18.74	19.18			19.62	18.74	15.65	19.62	14.33	17.86	18.52	18.08			
GRAIN MOISTURE (%)	13	13	13.2	13.1	13.4	13.1	13.1	13.1	13.1		13.1	13.2	13.3	13.2	13.2	13.3	13.1	13	13.2	13.15	0.12
STRAW MOISTURE (%)	7.5	7.4	7.9	7.3	7.6	9.3	8	7.5	7.8		7.7	7.1	7.5	8	8.2	7.2	7.4	7.2	7.5	7.68	0.54
CHAFF YIELD (t/ha)	1.36	1.47	1.55	1.58	1.41	1.45	1.48	2.11	1.55		1.66	1.61	1.21	1.48	1.48	1.38	1.61	1.38	1.48	1.51	0.20
CHAFF YIELD (lb/ac)	1217	1309	1380	1410	1261	1291	1320	1885	1384		1486	1439	1082	1320	1320	1231	1439	1231	1319	1351	175
STRAW YIELD (t/ha)	2.57	3.16	3.47	3.17	3.10	2.70	3.37	2.77	3.04		3.40	3.37	2.40	3.57	2.83	3.30	4.23	3.07	3.27	3.15	0.45
STRAW YIELD (lb/ac)	2291	2817	3093	2825	2766	2409	3004	2468	2709		3035	3004	2141	3182	2528	2944	3777	2736	2918	2814	398
GRAIN YIELD (t/ha)	2.61	2.82	2.97	2.90	2.93	2.77	2.83	2.90	2.84		3.00	2.83	2.37	2.97	2.17	2.70	2.80	2.73	2.70	2.77	0.22
GRAIN YIELD (lb/ac)	2329	2512	2647	2587	2617	2468	2528	2587	2534		2675	2528	2111	2647	1933	2409	2498	2439	2405	2470	201
GRAIN YIELD (bu/ac) @60 lb/bu	38.8	41.9	44.1	43.1	43.6	41.1	42.1	43.1	42.2		44.6	42.1	35.2	44.1	32.2	40.1	41.6	40.6	40.1	41.16	3.35
MOG/GRAIN	1.51	1.64	1.69	1.64	1.64	1.50	1.71	1.68	1.61		1.69	1.76	1.53	1.70	1.99	1.73	2.09	1.63	1.76	1.69	0.16
STRAW/GRAIN	0.98	1.12	1.17	1.09	1.06	0.98	1.19	0.95	1.07		1.13	1.19	1.01	1.20	1.31	1.22	1.51	1.12	1.21	1.14	0.14
CHAFF/MOG	0.36	0.32	0.31	0.33	0.31	0.35	0.31	0.43	0.34		0.33	0.32	0.34	0.29	0.34	0.29	0.28	0.31	0.31	0.33	0.04
CHAFF/STRAW	0.53	0.46	0.45	0.50	0.46	0.54	0.44	0.76	0.52		0.49	0.48	0.51	0.41	0.52	0.42	0.38	0.45	0.46	0.49	0.09
CHAFF/GRAIN	0.52	0.52	0.52	0.54	0.48	0.52	0.52	0.73	0.55		0.56	0.57	0.51	0.50	0.68	0.51	0.58	0.50	0.55	0.55	0.07
CHAFF MASS (kg) (adjusted)	3.00	3.19	4.27	4.39	3.92	3.94	4.08	5.86			4.56	4.50	3.37	4.08	4.08	3.84	4.48	3.84			
CHAFF MASS (lb) (adjusted)	6.61	7.02	9.42	9.69	8.64	8.68	9.01	12.93			10.05	9.91	7.42	9.01	8.99	8.47	9.88	8.47			
STRAW MASS (kg) (adjusted)	5.64	6.85	9.58	8.81	8.59	7.35	9.29	7.68			9.32	9.38	6.66	9.84	7.80	9.19	11.76	8.54			
STRAW MASS (lb) (adjusted)	12.44	15.11	21.12	19.41	18.94	16.20	20.49	16.93			20.55	20.69	14.68	21.70	17.20	20.25	25.93	18.82			
GRAIN MASS (kg) (adjusted)	5.39	5.74	7.73	7.56	7.62	7.21	7.39	7.56			7.73	7.38	6.16	7.73	5.64	7.02	7.30	7.13			
GRAIN MASS (lb) (adjusted)	11.89	12.66	17.03	16.67	16.80	15.90	16.28	16.67			17.05	16.27	13.57	17.03	12.44	15.48	16.09	15.73			
CHAFF YIELD (t/ha) (adjusted)	1.26	1.36	1.42	1.46	1.31	1.31	1.36	1.95	1.43		1.54	1.50	1.12	1.36	1.36	1.28	1.49	1.28	1.37	1.40	0.18
CHAFF YIELD (lb/ac) (adjusted)	1125.8	1212.6	1270.9	1306.7	1165.1	1170.6	1214.8	1744.0	1276.3		1370.2	1337.2	1001.3	1214.8	1212.1	1142.5	1332.8	1142.5	1219.2	1248	162
STRAW YIELD (t/ha) (adjusted)	2.38	2.92	3.19	2.94	2.86	2.45	3.10	2.56	2.80		3.14	3.13	2.22	3.28	2.60	3.06	3.92	2.85	3.02	2.91	0.42
STRAW YIELD (lb/ac) (adjusted)	2119.6	2608.4	2848.5	2618.9	2555.5	2184.8	2763.3	2283.2	2497.8		2801.5	2790.4	1980.6	2927.5	2320.5	2732.2	3497.3	2539.0	2698.6	2598	371
GRAIN YIELD (t/ha) (adjusted)	2.27	2.45	2.58	2.52	2.54	2.40	2.46	2.52	2.47		2.61	2.46	2.05	2.58	1.88	2.34	2.43	2.38	2.34	2.40	0.20
GRAIN YIELD (lb/ac) (adjusted)	2329.0	2512.3	2646.7	2587.3	2617.0	2468.3	2527.8	2587.3	2534.5		2674.6	2527.8	2111.5	2646.7	1933.0	2408.8	2498.1	2438.6	2404.9	2470	201
MOG YIELD (t/ha) (adjusted)	3.64	4.28	4.62	4.40	4.17	3.76	4.46	4.51	4.23		4.68	4.63	3.34	4.64	3.96	4.34	5.41	4.13	4.39	4.31	0.49
MOG YIELD (lb/ac) (adjusted)	3245.4	3821.0	4119.1	3925.7	3720.6	3355.4	3978.1	4027.2	3774.1		4171.8	4127.5	2981.9	4142.3	3532.6	3874.7	4830.2	3681.5	3917.8	3846	437
MOG/GRAIN (adjusted)	1.60	1.75	1.79	1.75	1.64	1.56	1.81	1.79	1.71		1.79	1.88	1.63	1.80	2.11	1.86	2.23	1.74	1.88	1.80	0.17
STRAW/GRAIN (adjusted)	1.05	1.19	1.24	1.16	1.13	1.02	1.26	1.02	1.13		1.21	1.27	1.08	1.27	1.36	1.31	1.61	1.20	1.29	1.21	0.15
CHAFF/MOG (adjusted)	0.35	0.32	0.31	0.33	0.31	0.35	0.31	0.43	0.34		0.33	0.32	0.34	0.29	0.34	0.29	0.28	0.31	0.31	0.33	0.04
CHAFF/STRAW (adjusted)	0.53	0.46	0.45	0.50	0.46	0.54	0.44	0.76	0.52		0.49	0.48	0.51	0.41	0.52	0.42	0.38	0.45	0.46	0.49	0.09
CHAFF/GRAIN (adjusted)	0.56	0.55	0.55	0.58	0.51	0.55	0.55	0.78	0.59		0.59	0.61	0.55	0.53	0.72	0.55	0.61	0.54	0.59	0.58	0.07

Table 3. Combine Collection Results for CPS.

COMBINE COLLECTION RESULTS

CPS WHEAT	HUMBOLDT								SEP 13, 2000	CPS WHEAT	HUMBOLDT								SEP 14, 2000	
	WINDROW #3									WINDROW #7									ALL RUNS	
RUN #	1	2	3	4	5	6	7	8	Mean	9	10	11	12	13	14	15	16	Mean	Mean	Std Dev
SWATH WIDTH (ft)	25	25	25	25	25	25	25	25		25	25	25	25	25	25	25	25			
DISTANCE COUNT	75	75	75	75	75	75	75	75		75	75	75	75	75	75	75	75			
COLLECTION DISTANCE (ft)	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9		12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9			
COLLECTION TIME (sec)	5.5	5.54	5.26	5.2	5.17	5.14	5.09	5.02		5.5	5.13	5.21	5.08	5.13	4.89	4.8	5.18			
COLLECTION AREA (sq ft)	323.4	323.4	323.4	323.4	323.4	323.4	323.4	323.4		323.4	323.4	323.4	323.4	323.4	323.4	323.4	323.4			
COLLECTION AREA (sq m)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0			
CHAFF MASS (kg)	6.54	6.04	4.85	5.05	4.34	4.74	4.44	3.64		3.64	4.14	3.84	3.54	3.14	3.14	3.84	3.34			
CHAFF MASS (lb)	14.42	13.32	10.69	11.13	9.57	10.45	9.79	8.02		8.02	9.13	8.47	7.80	6.92	6.92	8.47	7.36			
STRAW MASS (kg)	8.84	9.5	9.5	8	6.7	10.2	7.4	6.7		7.5	7.7	8.5	5.9	5.3	6.6	9.4	6.8			
STRAW MASS (lb)	31.79	29.36	23.57	24.54	21.09	23.04	21.58	17.69		17.69	20.12	18.66	17.21	15.26	15.26	18.66	16.23			
GRAIN MASS (kg)	15.6	15.6	14.8	14	13	13.7	12.8	9.4		11.5	11.4	10.7	9.8	10.2	8.3	9.2	9.3			
GRAIN MASS (lb)	34.4	34.4	32.6	30.9	28.7	30.2	28.2	20.7		25.4	25.1	23.6	21.6	22.5	18.3	20.3	20.5			
GRAIN MOISTURE (%)	15.2	15.6	15.6	15.3	14.5	14.8	14.8	14.7	15.06	15.2	15.1	15.3	15.2	14.8	14.7	14.5	14.3	14.89	14.98	0.39
STRAW MOISTURE (%)	8.1	7.2	7.1	7.6	7.1	7.1	7.1	7.4	7.34	5.7	5.5	5.7	5.5	4.9	4.6	5.4	5	5.29	6.31	1.12
CHAFF YIELD (t/ha)	2.18	2.01	1.61	1.68	1.44	1.58	1.48	1.21	1.65	1.21	1.38	1.28	1.18	1.05	1.05	1.28	1.11	1.19	1.42	0.33
CHAFF YIELD (lb/ac)	1942	1793	1440	1499	1289	1407	1318	1081	1471	1081	1229	1140	1051	932	932	1140	992	1062	1267	293
STRAW YIELD (t/ha)	2.94	3.16	3.16	2.66	2.23	3.39	2.46	2.23	2.78	2.50	2.56	2.83	1.96	1.76	2.20	3.13	2.26	2.40	2.59	0.48
STRAW YIELD (lb/ac)	4281	3954	3175	3306	2841	3103	2906	2383	3243	2383	2710	2514	2317	2055	2055	2514	2186	2342	2793	646
GRAIN YIELD (t/ha)	5.19	5.19	4.93	4.66	4.33	4.56	4.26	3.13	4.53	3.83	3.79	3.56	3.26	3.39	2.76	3.06	3.10	3.34	3.94	0.81
GRAIN YIELD (lb/ac)	4632	4632	4394	4157	3860	4068	3800	2791	4042	3414	3385	3177	2910	3028	2464	2732	2761	2984	3513	718
GRAIN YIELD (bu/acha)@60lb/bu	77.2	77.2	73.2	69.3	64.3	67.8	63.3	46.5	67.4	56.9	56.4	52.9	48.5	50.5	41.1	45.5	46.0	49.7	58.55	11.97
MOG/GRAIN	1.34	1.24	1.05	1.16	1.07	1.11	1.11	1.24	1.17	1.01	1.16	1.15	1.16	0.99	1.21	1.34	1.15	1.15	1.16	0.10
STRAW/GRAIN	0.92	0.85	0.72	0.80	0.74	0.76	0.76	0.85	0.80	0.70	0.80	0.79	0.80	0.68	0.83	0.92	0.79	0.79	0.80	0.07
CHAFF/MOG	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00
CHAFF/STRAW	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.00
CHAFF/GRAIN	0.42	0.39	0.33	0.36	0.33	0.35	0.35	0.39	0.36	0.32	0.36	0.36	0.36	0.31	0.39	0.42	0.36	0.36	0.36	0.03
CHAFF MASS (kg) (adjusted)	6.01	5.61	4.51	4.67	4.03	4.40	4.12	3.37		3.43	3.91	3.62	3.35	2.99	3.00	3.63	3.17			
CHAFF MASS (lb) (adjusted)	13.25	12.36	9.93	10.29	8.89	9.71	9.09	7.43		7.57	8.63	7.98	7.38	6.58	6.60	8.01	7.00			
STRAW MASS (kg) (adjusted)	8.12	8.82	8.83	7.39	6.22	9.48	6.87	6.20		7.07	7.28	8.02	5.58	5.04	6.30	8.89	6.46			
STRAW MASS (lb) (adjusted)	29.21	27.24	21.90	22.68	19.60	21.40	20.05	16.38		16.68	19.01	17.60	16.26	14.51	14.56	17.06	15.42			
GRAIN MASS (kg) (adjusted)	13.23	13.17	12.49	11.86	11.12	11.67	10.91	8.02		9.75	9.68	9.06	8.31	8.69	7.08	7.87	7.97			
GRAIN MASS (lb) (adjusted)	29.16	29.03	27.54	26.14	24.50	25.73	24.04	17.68		21.50	21.34	19.98	18.32	19.16	15.61	17.34	17.57			
CHAFF YIELD (t/ha) (adjusted)	2.00	1.87	1.50	1.55	1.34	1.47	1.37	1.12	1.53	1.14	1.30	1.21	1.11	0.99	1.00	1.21	1.06	1.13	1.33	0.29
CHAFF YIELD (lb/ac) (adjusted)	1785	1664	1338	1385	1197	1307	1225	1001	1363	1019	1162	1075	993	887	889	1079	942	1006	1184	262
STRAW YIELD (t/ha) (adjusted)	2.70	2.93	2.94	2.46	2.07	3.15	2.29	2.06	2.58	2.35	2.42	2.67	1.86	1.68	2.10	2.96	2.15	2.27	2.42	0.43
STRAW YIELD (lb/ac) (adjusted)	3934	3669	2949	3054	2639	2862	2700	2206	3004	2247	2561	2370	2190	1955	1961	2378	2077	2217	2611	577
GRAIN YIELD (t/ha) (adjusted)	4.40	4.38	4.16	3.95	3.70	3.88	3.63	2.67	3.85	3.25	3.22	3.02	2.77	2.89	2.36	2.62	2.65	2.85	3.35	0.67
GRAIN YIELD (lb/ac) (adjusted)	3928	3909	3709	3521	3300	3466	3238	2381	3431	2895	2874	2691	2467	2580	2102	2336	2366	2539	2985	602
MOG YIELD (t/ha) (adjusted)	4.01	4.80	3.44	4.01	3.41	4.62	3.66	3.19	4.10	3.50	3.72	3.87	2.97	2.67	3.09	4.17	3.21	3.40	3.75	0.66
MOG YIELD (lb/ac) (adjusted)	6719	6339	4287	4440	3836	5190	3925	3207	4367	3266	3722	3445	3183	2850	3456	3019	3223	3795	838	
MOG/GRAIN (adjusted)	1.07	1.10	1.07	1.02	0.92	1.19	1.01	1.19	1.07	1.08	1.15	1.28	1.07	0.92	1.31	1.59	1.21	1.20	1.14	0.17
STRAW/GRAIN (adjusted)	0.61	0.67	0.71	0.62	0.56	0.81	0.63	0.77	0.67	0.73	0.75	0.88	0.67	0.58	0.89	1.13	0.81	0.81	0.74	0.15
CHAFF/MOG (adjusted)	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00
CHAFF/STRAW (adjusted)	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.00
CHAFF/GRAIN (adjusted)	0.45	0.43	0.36	0.39	0.36	0.38	0.38	0.42	0.40	0.36	0.40	0.40	0.40	0.34	0.42	0.46	0.40	0.40		0.03

Table 4. Combine collection Results for HRS2.

COMBINE COLLECTION RESULTS

HRS WHEAT #2 — PLUNKET — SEP 26, 2000

		WINDROW #3					WINDROW #7								ALL RUNS	
RUN #		1	2	3	4	Mean	5	6	7	8	9	10	11	Mean	Mean	Std Dev
SWATH WIDTH (ft)		23	23	23	23		23	23	23	23	23	23	23			
LENGTH COUNT		96	301	745	301		301	301	301	301	301	301	301			
COLLECTION TIME (sec)		5.7	17.38	43.1	17.21		15.62	15.92	17.01	15.29	15.76	15.34	15.43			
COLLECTION AREA (sq ft)		360.9	1194.2	2955.8	1194.2		1194.2	1194.2	1194.2	1194.2	1194.2	1194.2	1194.2			
COLLECTION AREA (sq m)		35.4	110.9	274.6	110.9		110.9	110.9	110.9	110.9	110.9	110.9	110.9			
CHAFF MASS (kg)		1.74	7.64	21.04	8.34		4.74	8.14	6.64	5.54	5.14	6.04	4.74			
CHAFF MASS (lb)		3.84	16.84	46.38	18.39		10.45	17.95	14.64	12.21	11.33	13.32	10.45			
STRAW MASS (kg)		2.3	9.4	38.2	9.4		3.6	8.8	9.9	5.7	6.4	4.1	3.1			
STRAW MASS (lb)		8.46	37.13	102.26	40.53		7.94	19.40	21.83	12.57	14.11	9.04	6.83			
GRAIN MASS (kg)		1.4	3.7	12.3	8.2		4.1	4	3.3	3.9	2.2	5.7	4.9			
GRAIN MASS (lb)		3.09	8.16	27.12	18.08		9.04	8.82	7.28	8.60	4.85	12.57	10.80			
GRAIN MOISTURE (%)		15.1	15	15.2	14.7	15.0	14.7	14.6	14.6	14.5	14.8	14.6	14.6	14.6	14.75	0.24
STRAW MOISTURE (%)		7.9	7.5	6.4	6.3	7.0	7.4	9.9	7.4	8.4	6.8	6.7	6.2	7.3	7.17	1.07
CHAFF YIELD (t/ha)		0.49	0.69	0.77	0.75	0.67	0.43	0.73	0.60	0.50	0.46	0.54	0.43	0.53	0.58	0.13
CHAFF YIELD (lb/ac)		439	614	684	671	602	381	655	534	445	413	486	381	471	518	116
STRAW YIELD (t/ha)		0.65	0.86	1.39	0.85	0.93	0.32	0.79	0.89	0.51	0.58	0.37	0.28	0.54	0.68	0.32
STRAW YIELD (lb/ac)		967	1354	1507	1479	1327	289	708	796	458	515	330	249	478	787	478
GRAIN YIELD (t/ha)		0.40	0.33	0.45	0.74	0.48	0.37	0.36	0.30	0.35	0.20	0.51	0.44	0.39	0.40	0.14
GRAIN YIELD (lb/ac)		353	298	400	659	427	330	322	265	314	177	458	394	347	361	124
GRAIN YIELD (bu/ac) @ 60 lb/bu		5.9	5.0	6.7	11.0	7.1	5.5	5.4	4.4	5.2	2.9	7.6	6.6	5.8	6.01	2.06
MOG/GRAIN		2.89	4.61	4.82	2.16	3.62	2.03	4.24	5.01	2.88	5.25	1.78	1.60	3.26	3.39	1.41
STRAW/GRAIN		1.64	2.50	3.11	1.15	2.11	0.88	2.20	3.00	1.46	2.91	0.72	0.63	1.69	1.84	0.95
CHAFF/MOG		0.43	0.45	0.56	0.47	0.48	0.57	0.48	0.40	0.49	0.45	0.60	0.60	0.51	0.48	0.06
CHAFF/STRAW		0.21	0.21	0.21	0.21	0.21	0.60	0.42	0.30	0.44	0.36	0.57	0.69	0.50	0.39	0.19
CHAFF/GRAIN		1.24	2.06	1.71	1.02	1.51	1.16	2.04	2.01	1.42	2.84	1.06	0.97	1.57	1.55	0.50
CHAFF MASS (kg)	(adjusted)	1.60	7.07	19.69	7.81		4.39	7.33	6.15	5.19	4.79	5.64	4.45			
CHAFF MASS (lb)	(adjusted)	3.53	15.58	43.42	17.23		9.68	16.17	13.56	11.43	10.56	12.42	9.80			
STRAW MASS (kg)	(adjusted)	2.12	8.70	35.76	8.81		3.33	7.93	9.17	5.34	5.96	3.83	2.91			
STRAW MASS (lb)	(adjusted)	7.79	34.35	95.72	37.98		7.35	17.48	20.21	11.76	13.15	8.43	6.41			
GRAIN MASS (kg)	(adjusted)	1.19	3.15	10.43	6.99		3.50	3.42	2.82	3.33	1.87	4.87	4.18			
GRAIN MASS (lb)	(adjusted)	2.62	6.93	22.99	15.42		7.71	7.53	6.21	7.35	4.13	10.74	9.23			
CHAFF YIELD (t/ha)	(adjusted)	0.45	0.64	0.72	0.70	0.63	0.40	0.66	0.55	0.47	0.43	0.51	0.40	0.49	0.54	0.12
CHAFF YIELD (lb/ac)	(adjusted)	404	568	640	628	560	353	590	494	417	385	453	358	436	481	109
STRAW YIELD (t/ha)	(adjusted)	0.60	0.78	1.30	0.79	0.87	0.30	0.71	0.83	0.48	0.54	0.34	0.26	0.50	0.63	0.30
STRAW YIELD (lb/ac)	(adjusted)	891	1253	1411	1365	1235	268	638	737	429	480	308	234	442	730	446
GRAIN YIELD (t/ha)	(adjusted)	0.34	0.28	0.38	0.63	0.41	0.32	0.31	0.25	0.30	0.17	0.44	0.38	0.31	0.34	0.12
GRAIN YIELD (lb/ac)	(adjusted)	353	298	400	659	427	330	322	265	314	177	458	394	323	361	124
MOG YIELD (t/ha)	(adjusted)	1.05	1.42	2.02	1.50	1.50	0.70	1.38	1.36	0.95	0.97	0.85	0.68	0.98	1.17	0.41
MOG YIELD (lb/ac)	(adjusted)	757	1022	1039	1288	1027	683	911	760	731	562	912	752	758.53	842	197
MOG/GRAIN	(adjusted)	3.13	5.01	5.32	2.38	3.96	2.21	4.47	5.43	3.16	5.74	1.94	1.76	3.53	3.69	1.53
STRAW/GRAIN	(adjusted)	1.78	2.76	3.43	1.26	2.31	0.95	2.32	3.25	1.60	3.18	0.78	0.69	1.83	2.00	1.04
CHAFF/MOG	(adjusted)	0.43	0.45	0.36	0.47	0.43	0.57	0.48	0.40	0.49	0.45	0.60	0.60	0.51	0.48	0.08
CHAFF/STRAW	(adjusted)	0.75	0.81	0.75	0.89	0.75	1.30	0.96	0.67	0.97	0.80	1.47	1.53	1.10	0.97	0.33
CHAFF/GRAIN	(adjusted)	1.32	2.25	1.85	1.11	1.63	2.78	2.15	2.18	1.56	2.59	1.85	1.66	2.17	1.68	0.54

Table 3. Combine Collection Results for CPS.

COMBINE COLLECTION RESULTS

CPS WHEAT			HUMBOLDT							SEP 13, 2000	CPS WHEAT		HUMBOLDT							SEP 14, 2000
		WINDROW #3									WINDROW #7									ALL RUNS
RUN #		1	2	3	4	5	6	7	8	Mean	9	10	11	12	13	14	15	16	Mean	Mean	Std Dev
SWATH WIDTH (ft)		25	25	25	25	25	25	25	25		25	25	25	25	25	25	25	25			
DISTANCE COUNT		75	75	75	75	75	75	75	75		75	75	75	75	75	75	75	75			
COLLECTION DISTANCE (ft)		12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9		12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9			
COLLECTION TIME (sec)		5.5	5.54	5.26	5.2	5.17	5.14	5.09	5.02		5.5	5.13	5.21	5.08	5.13	4.89	4.8	5.16			
COLLECTION AREA (sq ft)		323.4	323.4	323.4	323.4	323.4	323.4	323.4	323.4		323.4	323.4	323.4	323.4	323.4	323.4	323.4	323.4			
COLLECTION AREA (sq m)		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0		30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0			
CHAFF MASS (kg)		6.54	6.04	4.65	5.05	4.34	4.74	4.44	3.84		3.64	4.14	3.84	3.54	3.14	3.14	3.84	3.34			
CHAFF MASS (lb)		14.42	13.32	10.69	11.13	9.57	10.45	9.79	8.02		8.02	9.13	8.47	7.80	6.92	6.92	8.47	7.36			
STRAW MASS (kg)		8.84	9.5	9.5	8	6.7	10.2	7.4	6.7		7.5	7.7	8.5	5.9	5.3	6.6	9.4	6.8			
STRAW MASS (lb)		31.79	29.36	23.57	24.54	21.09	23.04	21.58	17.69		17.69	20.12	18.88	17.21	15.26	15.26	18.66	16.23			
GRAIN MASS (kg)		15.6	15.6	14.8	14	13	13.7	12.8	9.4		11.5	11.4	10.7	9.8	10.2	8.3	9.2	9.3			
GRAIN MASS (lb)		34.4	34.4	32.6	30.9	28.7	30.2	28.2	20.7		25.4	25.1	23.6	21.6	22.5	18.3	20.3	20.5			
GRAIN MOISTURE (%)		14.5	14.5	14.5	14.5	14.5	14.6	14.8	14.7	15.08	15.2	15.1	15.4	15.0	14.6	14.7	14.8	14.8	14.89	14.98	0.39
STRAW MOISTURE (%)		7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	6.31	0.2
CHAFF YIELD (t/ha)		2.08	2.01	1.61	1.68	1.44	1.58	1.48	1.21	1.65	1.21	1.30	1.28	1.18	1.05	1.05	1.28	1.11	1.19	1.42	0.33
CHAFF YIELD (lb/ac)		1847	1791	1434	1498	1289	1407	1316	1081	1470	1081	1229	1140	1051	937	937	1140	992	1062	1267	293
STRAW YIELD (t/ha)		2.94	3.16	3.16	2.66	2.23	3.39	2.46	2.23	2.78	2.50	2.56	2.83	1.96	1.76	2.20	3.13	2.26	2.40	2.59	0.48
STRAW YIELD (lb/ac)		4261	3954	3175	3306	2841	3103	2908	2363	3243	2383	2710	2514	2317	2055	2055	2514	2186	2342	2793	646
GRAIN YIELD (t/ha)		5.19	5.19	4.93	4.66	4.33	4.56	4.26	3.13	4.53	3.83	3.79	3.56	3.26	3.39	2.76	3.06	3.10	3.34	3.94	0.81
GRAIN YIELD (lb/ac)		4632	4632	4394	4157	3860	4068	3800	2791	4042	3414	3385	3177	2910	3028	2464	2732	2761	2984	3513	718
GRAIN YIELD (bu/acre) @60lb/bu		77.2	77.2	73.2	69.3	64.3	67.8	63.3	46.5	67.1	56.9	56.4	52.9	48.5	50.5	41.1	45.5	46.0	49.7	58.55	11.97
MOG/GRAIN																				1.16	0.10
STRAW/GRAIN																				0.80	0.07
CHAFF/MOG																				0.31	0.00
CHAFF/STRAW																				0.45	0.00
CHAFF/GRAIN																				0.36	0.03
CHAFF MASS (kg)	(adjusted)	6.01	5.61	4.51	4.67	4.09	4.40	4.12	3.37		3.43	3.91	3.62	3.35	2.99	3.00	3.63	3.17			
CHAFF MASS (lb)	(adjusted)	13.25	12.36	9.95	10.29	9.00	9.71	9.09	7.43		7.57	8.63	7.98	7.39	6.59	6.61	8.00	7.00			
STRAW MASS (kg)	(adjusted)	8.12	8.82	8.83	7.39	6.22	9.48	6.87	6.20		7.07	7.28	8.02	5.58	5.04	6.30	8.89	6.46			
STRAW MASS (lb)	(adjusted)	29.21	27.24	21.90	22.86	19.60	21.40	20.05	16.39		16.68	19.01	17.60	16.26	14.51	14.56	17.66	15.42			
GRAIN MASS (kg)	(adjusted)	13.23	13.17	12.49	11.86	11.12	11.57	10.91	8.02		9.75	9.68	9.06	8.31	8.69	7.08	7.87	7.97			
GRAIN MASS (lb)	(adjusted)	29.16	29.03	27.54	26.14	24.50	25.73	24.04	17.68		21.50	21.34	19.98	18.32	19.16	15.61	17.34	17.57			
CHAFF YIELD (t/ha)	(adjusted)	2.00	1.86	1.50	1.55	1.34	1.47	1.37	1.12	1.53	1.14	1.30	1.21	1.11	0.99	1.00	1.21	1.06	1.13	1.33	0.29
CHAFF YIELD (lb/ac)	(adjusted)	1784	1658	1337	1382	1197	1307	1221	1001	1364	1019	1162	1080	990	885	892	1079	942	1006	1184	262
STRAW YIELD (t/ha)	(adjusted)	2.70	2.93	2.94	2.46	2.07	3.15	2.29	2.06	2.58	2.35	2.42	2.67	1.85	1.68	2.10	2.96	2.15	2.27	2.42	0.43
STRAW YIELD (lb/ac)	(adjusted)	3934	3669	2949	3054	2639	2892	2700	2206	3006	2247	2561	2370	2190	1955	1961	2378	2077	2217	2611	577
GRAIN YIELD (t/ha)	(adjusted)	4.40	4.38	4.16	3.95	3.70	3.88	3.63	2.67	3.85	3.25	3.22	3.02	2.77	2.89	2.36	2.62	2.65	2.82	3.36	0.62
GRAIN YIELD (lb/ac)	(adjusted)	3926	3909	3709	3521	3300	3466	3236	2381	3435	2895	2874	2691	2467	2580	2102	2336	2366	2519	2995	602
MOG/GRAIN	(adjusted)									1.00									1.40	3.75	0.66
MOG/YIELD (t/ha)	(adjusted)																			3795	838
MOG/GRAIN	(adjusted)	1.02	1.01	1.02	0.92	0.92	1.19	1.01	1.19	1.07	1.08	1.18	1.20	1.19	1.17	1.07	1.07	1.07	1.20	1.14	0.17
STRAW/GRAIN	(adjusted)	0.61	0.67	0.71	0.62	0.56	0.81	0.63	0.77	0.67	0.73	0.75	0.88	0.67	0.58	0.89	1.13	0.81	0.81	0.74	0.15
CHAFF/MOG																				0.31	0.00
CHAFF/STRAW																				0.45	0.00
CHAFF/GRAIN																					

Table 4. Combine collection Results for HRS2.

COMBINE COLLECTION RESULTS

HRS WHEAT #2 — PLUNKET — SEP 26, 2000

		WINDROW #3					WINDROW #7							ALL RUNS	
RUN #		1	2	3	4		5	6	7	8	9	10	11	Mean	S(n-1)
SWATH WIDTH (ft)		23	23	23	23		23	23	23	23	23	23	23		
LENGTH COUNT		96	301	745	301		301	301	301	301	301	301	301		
COLLECTION TIME (sec)		5.7	17.38	43.1	17.21		15.62	15.92	17.01	15.29	15.76	15.34	15.43		
COLLECTION AREA (sq ft)		380.9	1194.2	2955.8	1194.2		1194.2	1194.2	1194.2	1194.2	1194.2	1194.2	1194.2		
COLLECTION AREA (sq m)		35.4	110.9	274.6	110.9		110.9	110.9	110.9	110.9	110.9	110.9	110.9		
CHAFF MASS (kg)															
CHAFF MASS (lb)															
STRAW MASS (kg)		2.3	9.4	38.2	9.4		3.6	8.8	9.9	5.7	6.4	4.1	3.1		
STRAW MASS (lb)		8.46	37.13	102.26	40.53		7.94	19.40	21.83	12.57	14.11	9.04	6.83		
GRAIN MASS (kg)		1.4	3.7	12.3	6.2		4.1	4	3.3	3.9	2.2	5.7	4.9		
GRAIN MASS (lb)		3.09	8.16	27.12	18.08		9.04	8.82	7.28	8.60	4.85	12.57	10.80	14.75	
GRAIN MOISTURE (%)														7.17	
STRAW MOISTURE (%)														0.58	
CHAFF YIELD (t/ha)							0.43	0.73	0.60	0.50				518	
CHAFF YIELD (lb/ac)							381	655	534	446				0.68	
STRAW YIELD (t/ha)		0.65	0.86	1.39	0.85		0.32	0.79	0.89	0.51	0.58	0.37	0.28	787	
STRAW YIELD (lb/ac)		967	1354	1507	1479		289	708	796	458	515	330	249	0.40	
GRAIN YIELD (t/ha)		0.40	0.33	0.45	0.74		0.37	0.36	0.30	0.35	0.20	0.51	0.44	361	
GRAIN YIELD (lb/ac)		353	298	400	659		330	322	265	314	177	458	394	6.01	
GRAIN YIELD (bu/ac) @ 60 lb/bu		5.9	5.0	6.7	11.0		5.5	5.4	4.4	5.2	2.9	7.6	6.6	3.39	
MOG/GRAIN														1.84	
STRAW/GRAIN														0.48	
CHAFF/MOG														0.39	
CHAFF/STRAW														1.55	
CHAFF/GRAIN															
CHAFF MASS (kg)	(adjusted)														
CHAFF MASS (lb)	(adjusted)														
STRAW MASS (kg)	(adjusted)	2.12	8.70	35.76	8.81		3.33	7.93	9.17	5.34	5.96	3.83	2.91		
STRAW MASS (lb)	(adjusted)	7.79	34.35	95.72	37.98		7.35	17.48	20.21	11.76	13.15	8.43	6.41		
GRAIN MASS (kg)	(adjusted)	1.19	3.15	10.43	6.99		3.50	3.42	2.82	3.33	1.87	4.87	4.18		
GRAIN MASS (lb)	(adjusted)	2.62	6.93	22.99	15.42		7.71	7.53	6.21	7.35	4.13	10.74	9.23		
CHAFF YIELD (t/ha)	(adjusted)														
CHAFF YIELD (lb/ac)	(adjusted)														
STRAW YIELD (t/ha)	(adjusted)	0.60	0.78	1.30	0.79		0.30	0.71	0.83	0.48	0.54	0.34	0.26		
STRAW YIELD (lb/ac)	(adjusted)	691	1253	1411	1365		268	638	737	429	480	306	234		
GRAIN YIELD (t/ha)	(adjusted)	0.34	0.28	0.38	0.63		0.32	0.31	0.25	0.30	0.17	0.44	0.38		
GRAIN YIELD (lb/ac)	(adjusted)	353	298	400	659		330	322	265	314	177	458	394		
MOG/GRAIN															
MOG/GRAIN	(adjusted)														
STRAW/GRAIN															
CHAFF/MOG															
CHAFF/STRAW															
CHAFF/GRAIN															

Table 5. Baling Results for HRS1.

FIELD TEST PLOT RESULTS

HRS WHEAT #1					HUMBOLDT						SEPTEMBER 2000	
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE OPERATION	CONV	CONV	CONV		CONV						
BALING OPERATION	SQUARE	SQUARE	SQUARE	None	ROUND	ROUND	None	SQUARE	SQUARE		
BALING DATE	20-Sep	25-Sep	14-Sep	14-Sep	14-Sep	14-Sep	14-Sep	14-Sep	15-Sep		
SWATH WIDTH(m)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9		
SWATH WIDTH(ft)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5		
SWATH LENGTH(m)	783.9	783.9	769.0	767.8	748.3	744.6	737.0	734.9	732.4		
SWATH LENGTH (ft)	2572	2572	2523	2519	2455	2443	2418	2411	2403		
AREA HARVESTED (hectares)	0.47	0.47	0.46	0.46	0.44	0.44	0.44	0.44	0.44		
AREA HARVESTED (acres)	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1		
NUMBER OF BALES	[illegible]	[illegible]	[illegible]	XXX	[illegible]	[illegible]	XXX	[illegible]	[illegible]	Means	Std Dev
BALED STRAW MOISTURE (%)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	XXX	[illegible]	[illegible]	[illegible]	[illegible]	0.57
BALE MASS (kg)	1308.2	1262.8	1398.9	XXX	1193.9	XXX	XXX	646.8	801.0		
BALE MASS (lb)	2884	2784	3084	XXX	2632	XXX	XXX	1426	1766		
STRAW YIELD (t/ha)	2.81	2.71	3.06	XXX	2.68	XXX	XXX	1.48	1.84		0.62
STRAW YIELD (t/ha from collections)											
STRAW YIELD (lb/sec)	2505	2418	2731	XXX	2395	XXX	XXX	1321	1642		555
GRAIN MOISTURE (%)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.09
GRAIN MASS (Kg)	1229.2	1283.7	1138.5	1397.1	1147.6	1052.3	1120.4	988.8	943.5		
GRAIN MASS (lb)	2710	2830	2510	3080	2530	2320	2470	2180	2080		
GRAIN YIELD (t/ha)	2.64	2.75	2.49	3.06	2.58	2.36	2.56	2.26	2.17		0.27
GRAIN YIELD (lb/ac)	2354	2458	2222	2731	2302	2121	2282	2020	1934		239
GRAIN YIELD (bu/ac@ 60 lb/bu)	39.2	41.0	37.0	45.5	38.4	35.4	38.0	33.7	32.2		4.0
GRAIN YIELD (bu/ac from collections)				42.2			40.1				
STRAW/GRAIN RATIO	[illegible]	[illegible]	[illegible]	XXX	[illegible]	XXX	XXX	[illegible]	[illegible]	[illegible]	0.20
STRAW/GRAIN RATIO from collections						XXX					
BALE MASS (kg) - Adjusted	1189	1168	1295	XXX	1104	XXX	XXX	598	736		
BALE MASS (lb) - Adjusted	2622	2575	2856	XXX	2435	XXX	XXX	1318	1623		
GRAIN MASS (kg) - Adjusted	1068	1118	991	1214	998	916	972	860	820		
GRAIN MASS (lb) - Adjusted	2355	2465	2184	2677	2201	2018	2144	1897	1808		
STRAW YIELD (t/ha)-Adjusted	2.55	2.51	2.84	XXX	2.48	XXX	XXX	1.37	1.69		0.57
STRAW YIELD (t/ha)-Adjusted (from collections)											
STRAW YIELD (lb/ac)- Adjusted	2277	2237	2528	2498	2215	XXX	2699	1221	1509		517
GRAIN YIELD (t/ha) - Adjusted	2.29	2.40	2.17	2.66	2.25	2.07	2.22	1.97	1.88		0.23
GRAIN YIELD (t/ha from collections)				2.47			2.34				
GRAIN YIELD (lb/ac) - Adjusted	2045	2141	1933	2374	2003	1846	1981	1757	1680		216
STRAW/GRAIN RATIO - Adjusted	[illegible]	[illegible]	[illegible]	XXX	[illegible]	XXX	XXX	[illegible]	[illegible]	[illegible]	0.21
STRAW/GRAIN RATIO - Adjusted from collections											

Table 6. Baling Results for CPS.

FIELD TEST PLOT RESULTS

CPS WHEAT				HUMBOLDT					SEPTEMBER 2000		
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE OPERATION											
BALING OPERATION	SQUARE	SQUARE	ROUND	SQUARE	ROUND	ROUND	ROUND	ROUND	SQUARE		
BALING DATE	20-Sep	25-Sep	13-Sep	13-Sep	13-Sep	13-Sep	13-Sep	13-Sep	15-Sep		
SWATH WIDTH(m)	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62		
SWATH WIDTH(ft)	25	25	25	25	25	25	25	25	25		
SWATH LENGTH(m)	542.5	542.5	542.5	542.5	542.5	542.5	542.5	542.5	542.5		
SWATH LENGTH(ft)	1780	1780	1780	1780	1780	1780	1780	1780	1780		
AREA HARVESTED (hectares)	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41		
AREA HARVESTED (acres)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
NUMBER OF BALES	33	35	54	54	39	37	39	39	37	Mean	Std Dev
STRAW MOISTURE (%)	9.5	9.5	7.8	8.5	11.1	11.2	9.5	9.5	9.5	9.6	1.8
BALE MASS (kg)	714.0	707.6	799.2	789.2	785.6	576.1	684.0	660.4	675.8		
BALE MASS (lb)	1574	1560	1762	1740	1732	1270	1508	1434	1490		
STRAW YIELD (t/ha)	1.73	1.71	1.93	1.91	1.90	1.39	1.65	1.57	1.63		0.18
STRAW YIELD (t/ha from collections)										1.76	0.27
STRAW YIELD (lb/ac)	1541	1527	1725	1703	1695	1243	1476	1404	1459	1580	159
GRAIN MOISTURE (%)	16	16	15.1	16.5	15.2	14.5	14.9	14.8	14.2	15.1	0.7
GRAIN MASS (kg)	1674	1637	1715	1769	1619	1279	1715	1329	1284		
GRAIN MASS (lb)	3690	3610	3780	3900	3570	2820	3780	2930	2830		
GRAIN YILED (t/ha)	4.05	3.96	4.15	4.28	3.92	3.09	4.15	3.21	3.10	3.77	0.49
GRAIN YIELD (lb/ac)	3612	3534	3700	3818	3495	2760	3700	2868	2770	3362	433
GRAIN YIELD (bu/ac @ 60 lb/bu)	62	60	63	65	60	47	63	49	47	57.2	7.4
GRAIN YIELD (bu/ac from collections)			67				50.2			58.6	
STRAW/GRAIN RATIO	0.43	0.43	0.47	0.45	0.49	0.45	0.40	0.49	0.55	0.46	0.04
STRAW/GRAIN RATIO (from collections)										0.46	
BALE MASS (kg) - Adjusted	645	664	741	722	725	551	648	622	635		
BALE MASS (lb) - Adjusted	1423	1465	1633	1592	1599	1214	1428	1371	1399		
GRAIN MASS (Kg) - Adjusted	1423	1374	1456	1477	1373	1094	1459	1135	1101		
GRAIN MASS (lb) - Adjusted	3137	3029	3209	3257	3027	2411	3217	2502	2428		
STRAW YIELD (t/ha) - Adjusted	1.56	1.61	1.79	1.75	1.75	1.33	1.57	1.50	1.54	1.60	0.15
STRAW YIELD (t/ha) - Adjusted (from collections)										2.41	
STRAW YIELD (lb/ac) -Adjusted	1393	1434	1599	1558	1565	1186	1398	1342	1370	1427	130
GRAIN YIELD (t/ha) - Adjusted	3.44	3.32	3.52	3.57	3.32	2.65	3.53	2.75	2.66	3.20	0.39
GRAIN YIELD (t/ha) - Adjusted (from collections)			3.85				2.85			3.45	
GRAIN YIELD (lb/ac) - Adjusted	3070	2965	3141	3188	2963	2360	3149	2449	2377	2851	351
STRAW/GRAIN RATIO (t/t)	0.45	0.49	0.46	0.49	0.53	0.56	0.45	0.55	0.58	0.50	0.04
STRAW/GRAIN RATIO											

Table 5. Baling Results for HRS1.

FIELD TEST PLOT RESULTS

HRS WHEAT #1				HUMBOLDT						SEPTEMBER 2000	
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE OPERATION	CONV	CONV	CONV	REF (Conv)	CONV	[illegible]	REF (Conv)	[illegible]			
BALING OPERATION	SQUARE	SQUARE	SQUARE	None	ROUND	ROUND	None	SQUARE	SQUARE		
BALING DATE	20-Sep	25-Sep	14-Sep	14-Sep	14-Sep	14-Sep	14-Sep	14-Sep	15-Sep		
SWATH WIDTH(m)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9		
SWATH WIDTH(ft)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5		
SWATH LENGTH(m)	783.9	783.9	769.0	767.8	748.3	744.6	737.0	734.9	732.4		
SWATH LENGTH (ft)	2572	2572	2523	2519	2455	2443	2418	2411	2403		
AREA HARVESTED (hectares)	0.47	0.47	0.46	0.46	0.44	0.44	0.44	0.44	0.44		
AREA HARVESTED (acres)	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1		
NUMBER OF BALES	74	59	73	XXX	44	0	XXX	43	38	Mean	Std Dev
BALED STRAW MOISTURE (%)	9.1	7.5	7.4	7.8	7.5	XXX	7.5	7.6	8.1	7.8	0.57
BALE MASS (kg)	1308.2	1262.8	1398.9	XXX	1193.9	XXX	XXX	646.8	801.0		
BALE MASS (lb)	2884	2784	3084	XXX	2632	XXX	XXX	1426	1766		
STRAW YIELD (t/ha)	2.81	2.71	3.06	XXX	2.68	XXX	XXX	1.48	1.84	2.43	0.62
STRAW YIELD (t/ha from collections)				[illegible]			[illegible]			3.16	
STRAW YIELD (lb/ac)	2505	2418	2731	XXX	2395	XXX	XXX	1321	1642	2169	555
GRAIN MOISTURE (%)	13.1	12.9	13	13.1	13	13	13.2	13	13.1	13.0	0.09
GRAIN MASS (Kg)	1229.2	1283.7	1138.5	1397.1	1147.6	1052.3	1120.4	988.8	943.5		
GRAIN MASS (lb)	2710	2830	2510	3080	2530	2320	2470	2180	2080		
GRAIN YIELD (t/ha)	2.64	2.75	2.49	3.06	2.58	2.38	2.56	2.26	2.17	2.54	0.27
GRAIN YIELD (lb/ac)	2354	2458	2222	2731	2302	2121	2282	2020	1934	2269	239
GRAIN YIELD (bu/ac@ 60 lb/bu)	39.2	41.0	37.0	45.5	38.4	35.4	38.0	33.7	32.2	37.8	4.0
GRAIN YIELD (bu/ac from collections)				42.2			40.1			41.2	
STRAW / GRAIN RATIO	1.1	1.0	1.2	XXX	1.0	XXX	XXX	0.7	0.8	0.97	0.20
STRAW / GRAIN RATIO (from collections)						XXX				1.15	
BALE MASS (kg) - Adjusted	1189	1168	1295	XXX	1104	XXX	XXX	598	736		
BALE MASS (lb) - Adjusted	2622	2575	2856	XXX	2435	XXX	XXX	1318	1623		
GRAIN MASS (kg) - Adjusted	1068	1118	991	1214	998	916	972	860	820		
GRAIN MASS (lb) - Adjusted	2355	2465	2184	2677	2201	2018	2144	1897	1808		
STRAW YIELD (t/ha)-Adjusted	2.55	2.51	2.84	XXX	2.48	XXX	XXX	1.37	1.69	2.24	0.57
STRAW YIELD (t/ha)-Adjusted (from collections)				[illegible]			[illegible]			2.91	
STRAW YIELD (lb/ac)- Adjusted	2277	2237	2528	2498	2215	XXX	2699	1221	1509	2148	517
GRAIN YIELD (t/ha) - Adjusted	2.29	2.40	2.17	2.66	2.25	2.07	2.22	1.97	1.88	2.21	0.23
GRAIN YIELD (t/ha from collections)				2.47			2.34			2.41	
GRAIN YIELD (lb/ac) - Adjusted	2045	2141	1933	2374	2003	1846	1981	1757	1680	2177	216
STRAW / GRAIN RATIO - Adjusted	1.11	1.04	1.31	XXX	1.11	XXX	XXX	0.69	0.90	1.03	0.21
STRAW / GRAIN RATIO - Adjusted (from collections)	[illegible]									1.21	

Table 6. Baling Results for CPS.

FIELD TEST PLOT RESULTS											
CPS WHEAT				HUMBOLDT						SEPTEMBER 2000	
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE OPERATION	CONV	CONV		CONV	CONV						
BALING OPERATION	SQUARE	SQUARE	ROUND	SQUARE	ROUND	ROUND	ROUND	SQUARE	SQUARE		
BALING DATE	20-Sep	25-Sep	13-Sep	13-Sep	13-Sep	13-Sep	13-Sep	13-Sep	15-Sep		
SWATH WIDTH(m)	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62		
SWATH WIDTH(ft)	25	25	25	25	25	25	25	25	25		
SWATH LENGTH(m)	542.5	542.5	542.5	542.5	542.5	542.5	542.5	542.5	542.5		
SWATH LENGTH(ft)	1780	1780	1780	1780	1780	1780	1780	1780	1780		
AREA HARVESTED (hectares)	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41		
AREA HARVESTED (acres)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
NUMBER OF BALES	33	35	3	54	3	3	3	39	37	Mean	Std Dev
STRAW MOISTURE (%)	9.6	6.1	7.3	8.5	7.7	4.4	5.3	4.4	6.1	6.6	1.8
BALE MASS (kg)	714.0	707.6	799.2	789.2	785.6	576.1	684.0	650.4	675.8		
BALE MASS (lb)	1574	1560	1762	1740	1732	1270	1508	1434	1490		
STRAW YIELD (t/ha)	1.73	1.71	1.93	1.91	1.90	1.39	1.65	1.57	1.63	1.7	0.18
STRAW YIELD (t/ha from collections)										2.6	0.27
STRAW YIELD (lb/ac)	1541	1527	1725	1703	1695	1243	1476	1404	1459	1600	159
GRAIN MOISTURE (%)	15	16.1	15.1	16.5	15.2	14.5	14.9	14.6	14.2	15.1	0.7
GRAIN MASS (kg)	1674	1637	1715	1769	1619	1279	1715	1329	1284		
GRAIN MASS (lb)	3690	3610	3780	3900	3570	2820	3780	2930	2830		
GRAIN YILED (t/ha)	4.05	3.96	4.15	4.28	3.92	3.09	4.15	3.21	3.10	3.77	0.49
GRAIN YIELD (lb/ac)	3612	3534	3700	3818	3495	2760	3700	2868	2770	3362	433
GRAIN YIELD (bu/ac @ 60 lb/bu)	62	60	63	65	60	47	63	49	47	57.2	7.4
GRAIN YIELD (bu/ac from collections)			67				50			58.6	
STRAW / GRAIN RATIO	0.43	0.43	0.47	0.45	0.49	0.45	0.40	0.49	0.53	0.46	0.04
STRAW / GRAIN RATIO (from collections)										0.8	
BALE MASS (kg) - Adjusted	645	664	741	722	725	551	648	622	635		
BALE MASS (lb) - Adjusted	1423	1465	1633	1592	1599	1214	1428	1371	1399		
GRAIN MASS (Kg) - Adjusted	1423	1374	1456	1477	1373	1094	1459	1135	1101		
GRAIN MASS (lb) - Adjusted	3137	3029	3209	3257	3027	2411	3217	2502	2428		
STRAW YIELD (t/ha) - Adjusted	1.56	1.61	1.79	1.75	1.75	1.33	1.57	1.50	1.54	1.60	0.15
STRAW YIELD (t/ha) - Adjusted (from collections)										2.4	
STRAW YIELD (lb/ac) -Adjusted	1393	1434	1599	1558	1565	1188	1398	1342	1370	1427	130
GRAIN YIELD (t/ha) - Adjusted	3.44	3.32	3.52	3.57	3.32	2.65	3.53	2.75	2.66	3.20	0.39
GRAIN YIELD (t/ha) - Adjusted (from collections)			3.85				2.85			3.4	
GRAIN YIELD (lb/ac) - Adjusted	3070	2965	3141	3188	2963	2360	3149	2449	2377	2851	351
STRAW / GRAIN RATIO-Adjusted	0.45	0.48	0.51	0.49	0.53	0.50	0.44	0.55	0.58	0.50	0.04
STRAW / GRAIN RATIO - Adjusted (from collections)										0.74	

Table 7. Baling Results for HRS2.

FIELD TEST PLOT RESULTS

HRS WHEAT #2				PLUNKET						SEPTEMBER 2000	
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE TYPE	CONV.	CONV.	[illegible]	CONV.	CONV.		[illegible]				
BALE TYPE	SQUARE	SQUARE	ROUND	SQUARE	ROUND	ROUND	ROUND	SQUARE	SQUARE		
BALING DATE	2/Oct	7-Oct	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	27-Sep		
SWATH WIDTH (m)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
SWATH WIDTH (ft)	23	23	23	23	23	23	23	23	23		
SWATH LENGTH (m)	644.0	645.0	645.9	646.5	647.4	648.3	649.2	649.8	650.7		
SWATH LENGTH (ft)	2113	2116	2119	2121	2124	2127	2130	2132	2135		
AREA HARVESTED (hectares)	0.45	0.45	0.45	0.45	0.45	0.45	0.46	0.46	0.46		
AREA HARVESTED (acres)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		
NUMBER OF BALES	21	22	[illegible]	19	[illegible]	None	[illegible]	17	12	Mean	Std Dev
STRAW MOISTURE (%)	20.7	13.8	7	6.8	5.9		7.3	6.5	7.1	9.4	5.2
BALE MASS (Kg)	442.7	315.7	346.5	326.6	341.1	XXX	312.1	292.6	231.3		
BALE MASS (lb)	976	696	764	720	752	XXX	688	645	510		
STRAW YIELD (t/ha)	0.98	0.70	0.77	0.72	0.75	XXX	0.69	0.64	0.51	0.72	0.13
STRAW YIELD (t/ha from collections)			[illegible]				[illegible]			0.74	
STRAW YIELD (lb/ac)	875	623	683	643	671	XXX	612	573	452	641	119
GRAIN MOISTURE (%)	14.6	14.8	15	14.8	14.3	14.7	14.6	14.6	14.5	14.7	0.20
GRAIN MASS (Kg)	222.3	222.3	176.9	226.8	204.1	167.8	181.4	158.8	154.2		
GRAIN MASS (lb)	490	490	390	500	450	370	400	350	340		
GRAIN YIELD (t/ha)	0.49	0.49	0.39	0.50	0.45	0.37	0.40	0.35	0.34	0.42	0.06
GRAIN YIELD (lb/ac)	439	439	349	446	401	329	356	311	302	375	58
GRAIN YIELD (bu/ac@ 60 lb/bu))	7.3	7.3	5.8	7.4	6.7	5.5	5.9	5.2	5.0	6.2	0.96
GRAIN YIELD (bu/ac from collections)			7.1				5.4			6.3	
STRAW / GRAIN RATIO	1.99	1.42	1.96	1.44	1.67	XXX	1.72	1.84	1.50	1.7	0.23
STRAW / GRAIN RATIO (from collections)										1.90	
BALE MASS (Kg) - Adjusted	351	272	322	304	321	XXX	289	274	215		
BALE MASS (lb) - Adjusted	774	600	711	671	708	XXX	638	603	474		
GRAIN MASS (Kg) - Adjusted	190	189	150	193	175	143	155	136	132		
GRAIN MASS (lb) - Adjusted	418	417	332	426	386	316	342	299	291		
STRAW YIELD (t/ha) - Adjusted	0.78	0.60	0.71	0.67	0.71	XXX	0.64	0.60	0.47	0.65	0.09
STRAW YIELD (t/ha) - Adjusted (from collections)			[illegible]				[illegible]			0.69	
STRAW YIELD (lb/ac)- Adjusted	784	558	610	574	598	XXX	544	509	401	572	107.7
GRAIN YIELD (t/ha) - Adjusted	0.42	0.42	0.33	0.43	0.39	0.31	0.34	0.30	0.29	0.36	0.06
GRAIN YIELD (t/ha) - Adjusted (from collections)			0.41				0.31			0.36	
GRAIN YIELD (lb/ac) - Adjusted	375	374	296	380	344	281	304	266	258	325	49
STRAW / GRAIN RATIO - Adjusted	1.85	1.44	2.14	1.58	1.83	XXX	1.87	2.02	1.63	1.79	0.23
STRAW / GRAIN RATIO - Adjusted (from collections)										2.07	

Table 7. Baling Results for HRS2.

FIELD TEST PLOT RESULTS

HRS WHEAT #2					PLUNKET						SEPTEMBER 2000	
SWATH #	1	2	3	4	5	6	7	8	9		
COMBINE TYPE											
BALE TYPE											
BALING DATE	2/Oct	7-Oct	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	27-Sep		
SWATH WIDTH (m)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
SWATH WIDTH (ft)	23	23	23	23	23	23	23	23	23		
SWATH LENGTH (m)	644.0	645.0	645.9	646.5	647.4	648.3	649.2	649.8	650.7		
SWATH LENGTH (ft)	2113	2116	2119	2121	2124	2127	2130	2132	2135		
AREA HARVESTED (hectares)	0.45	0.45	0.45	0.45	0.45	0.45	0.46	0.46	0.46		
AREA HARVESTED (acres)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		
NUMBER OF BALES				19		None					Std Dev
STRAW MOISTURE				8.8	8.9					8.4	5.2
BALE MASS (Kg)	442.7	315.7	346.5	326.6	341.1	XXX	312.1	292.6	231.3		
BALE MASS (lb)	976	696	764	720	752	XXX	688	645	510		
STRAW YIELD (t/ha)	0.98	0.70	0.77	0.72	0.75	XXX	0.69	0.64	0.51	0.72	0.13
STRAW YIELD (t/ha from collections)										0.74	
STRAW YIELD (lb/ac)	875	623	683	643	671	XXX	612	573	452	641	119
GRAIN MOISTURE (%)	14.6	14.8	15	14.8	14.3	14.7	14.6	14.6	14.5	14.7	0.20
GRAIN MASS (Kg)	222.3	222.3	176.9	226.8	204.1	167.8	181.4	158.8	154.2		
GRAIN MASS (lb)	490	490	390	500	450	370	400	350	340		
GRAIN YIELD (t/ha)	0.49	0.49	0.39	0.50	0.45	0.37	0.40	0.35	0.34	0.42	0.06
GRAIN YIELD (lb/ac)	439	439	349	446	401	329	356	311	302	375	58
GRAIN YIELD (bu/ac@ 60 lb/bu))	7.3	7.3	5.8	7.4	6.7	5.5	5.9	5.2	5.0	6.2	0.96
GRAIN YIELD (bu/ac from collections)			7.1				5.4			6.8	
STRAW / GRAIN RATIO	1.99	1.42	1.98	1.44	1.67	XXX	1.72	1.80	1.51	1.7	0.23
STRAW / GRAIN RATIO (from collections)										1.90	
BALE MASS (Kg) - Adjusted	351	272	322	304	321	XXX	289	274	215		
BALE MASS (lb) - Adjusted	774	600	711	671	708	XXX	638	603	474		
GRAIN MASS (Kg) - Adjusted	190	189	150	193	175	143	155	136	132		
GRAIN MASS (lb) - Adjusted	418	417	332	426	386	316	342	299	291		
STRAW YIELD (t/ha) - Adjusted	0.78	0.60	0.71	0.67	0.71	XXX	0.64	0.60	0.47	0.65	0.09
STRAW YIELD (t/ha) - Adjusted (from collections)										0.69	
STRAW YIELD (lb/ac)- Adjusted	784	558	610	574	598	XXX	544	509	401	572	107.7
GRAIN YIELD (t/ha) - Adjusted	0.42	0.42	0.33	0.43	0.39	0.31	0.34	0.30	0.29	0.36	0.06
GRAIN YIELD (t/ha) - Adjusted (from collections)			0.41				0.31			0.36	
GRAIN YIELD (lb/ac) - Adjusted	375	374	296	380	344	281	304	266	258	325	49
STRAW / GRAIN RATIO - Adjusted	2.08	1.43	2.16	1.58	2.06	XXX	2.11	2.26	1.81	1.93	0.23
STRAW / GRAIN RATIO - Adjusted (from collections)										2.10	